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COMMENTARY

EDITORIALS

ORIGINAL PAPERS

Lee et al found in their study that 44 mothers were overweight and 19 were obese. 82% of the mothers were aware of the risks. 70% of the doctors did not discuss weight issues with the mothers unless the BMI was greater than 35kg/m2.

McConnell et al report on the contraceptive practices of 1840 students. Condoms were used by 55%, the contraceptive pill by 39%, and coitus interruptus by 9%. Females spent over 100 euros and males 50 euros on contraception annually.

Azvee et al explore the patterns and driving forces of short-term mobility and long-term migration of Psychiatry Trainees. Most trainees (n=93, 90.3%) have 'ever' considered leaving Ireland and almost half (n = 41, 47.7%) have taken 'practical steps' towards migration.

Mayhew et al surveyed 96 patients on their views about same day surgery. 98% did not express any concerns about the process.

ORIGINAL PAPERS (Continued)

PREVALENCE OF SLEEP DISORDERED BREATHING IN AN AMBULATORY BARIATRIC POPULATION

Meurling et al assessed 81 patients with a mean BMI 53 kg/m2. 75 (93%) had obstructive sleep apnoea. The risk increased significantly with BMIs>50k/m2.

FINANCIAL RESILIENCE AMONG DOCTORS IN TRAINING AND THE COVID-19 PANDEMIC

Kijowski et al surveyed 161 NCHDs. Only 16% had income insurance. 6% had made a will. 25% had life insurance. In the event of death 63% of those with dependants felt that they would not be looked after.

A FOODBORNE OUTBREAK OF CRYPTOSPORIDIOSIS LIKELY LINKED TO SALAD LEAVES

Naughton et al describe 40 cases (33 confirmed, 7 suspected) of cryptosporidiosis related to salad boxes.

ESTABLISHING OR EXCLUDING A DIAGNOSIS OF FETAL VALPROATE SPECTRUM DISORDER IS A MULTI-LAYERED PROCESS

Kalim and Reardon describe the assessment of 40 patients with suspected fetal valproate spectrum disorders. In 11 cases the diagnosis was confirmed. 24 cases did not meet the diagnostic threshold. 5 cases were indeterminate. In 6 cases an alternative genetic cause was established.

OCCASIONAL PIECES

BECOME A BETTER TEACHER TODAY: EIGHT EASILY APPLICABLE WAYS TO IMPROVE YOUR SKILLS AS A CLINICAL TEACHER

SHORT REPORTS

DISCUSSION AND DOCUMENTATION OF "DO NOT ATTEMPT RESUSCITATION" DECISIONS IN AN INPATIENT POPULATION

McDonough and O'Hanlon report that 27 patients had a DNAR in place. No DNAR form was fully complete. In 20 cases it had not been discussed with the patient. Better communication and documentation are needed.

SHORT REPORTS (Continued)

SATISFACTORY IMPLEMENTATION OF PAEDIATRIC VIRTUAL CLINICS AND THE PERSPECTIVES OF PARENTS

Collins et reviewed children on a waiting list for over 36 months. 154 (66%) no longer needed an appointment. The authors found that virtual clinics led to a reduction in face to face appointments while maintaining parental satisfaction.

DECLINE IN PIGMENTED LESION REFERRALS AND MELANOMA DIAGNOSES DURING COVID-19 LOCKDOWN

Sazali et al report that pigmented lesion referrals were 17 in April 2020 compared with 76 in April 2019. Clinical stage-2 melanomas increased from 3 in Q2, 2020 to 16 in Q3, 2020.

AN ANALYSIS OF E-SCOOTER RELATED TRAUMA

Grace et al report 22 e-scooter related injuries. 15 had a confirmed fracture. 12 patients were not wearing a helmet at the time of the accident.

CASE REPORTS

MYELIN OLIGODENDROCYTE GLYCOPROTEIN (MOG) ANTIBODY RELATED DISEASE

Ennis et al describe a 20 year old who presented with leg weakness and urinary retention. The MRI of the spine showed myelitis, and the MOG antibody test was positive. He was treated with steroids and a plasma exchange.

HYPOSPADIAS AND COCAINE USE IN PREGNANCY

Finnegan et al report twin boys with hypospadias. There was a maternal history of cocaine use.

CASE SERIES

PATIENTS WITH COVID-19 AT THE END OF LIFE

Kelly et al describe the management at the end of life for patients with Covid-19.

LETTERS TO THE EDITOR

RESPONSE LETTERS

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Issue: Ir Med J; Vol 114; No. 6; P396

Medical Malpractice: A Multi-pronged Approach is Required

M. Sheehan

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Dear Sir,

I am writing in response to the editor's timely commentary piece 'Medical Malpractice: Paying Twice for Patient Care'.

Clinical improvements including staff retention and training, infrastructure investment, appropriate equipment improvements, and bringing IT up to date should reduce adverse events in healthcare, and hence, litigation costs. However, this may not be enough to curb the trends toward rising claim awards and increased legal bills. Indeed, the editor acknowledges that 'the rising malpractice costs over the past decade are due to three factors, 45% are due to the rise in claims, 34% are due to the rise in damages awarded, and 21% are due to a rise in claimants' legal costs.' Reducing clinical errors is only one piece of this puzzle; unfortunately, some adverse outcomes are inevitable in healthcare[1].

Individual damages awards are increasing yearly, in a manner described as 'unsustainable'[2]. The cost of settling a claim increases as time goes on[3]. The lack of an efficient and timely system for dealing with medical negligence claims is adding to the financial burden. It also prolongs stress and disruption for claimants and healthcare professionals.

The recent adoption of guidelines on personal injury awards is expected to significantly reduce claims and associated legal costs[4]. In my opinion, a review of medical negligence claims should follow urgently, to examine whether similar reforms would be beneficial.

Yours sincerely,

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The Longterm Outcome for Preterm Infants

J.F.A. Murphy - Editor of the Irish Medical Journal

It is universally recognised that preterm infants are at increased risk of suffering from cerebral palsy and neurodevelopmental delay. The difficulty is in quantifying the degree of risk, particularly when the infant has normal brain imaging. Follow-up studies are the main tool that is used to assess the outcomes for preterm infants. Outcome statistics are needed for counselling families on what to expect as their preterm child grows up. They facilitate decision-making for the child's important events such as school entry. The concept of school readiness[1] is important because it brings a large number of factors into play[1].

The outcome data inform doctors on how best to employ screening developmental tools. They provide a benchmark for neonatal units on how well they are performing. Although they are time-consuming, and difficult to organise on a national scale the findings are an invaluable resource for the provision of optimal longterm care. The cost is estimated at $1,000 per child[2].

The ideal outcome for a preterm infant is a 2 year-old child who is walking freely, no abnormal neurological signs, talking 2-3 word sentences, no visual or hearing deficits, and no major behaviour problems. Interventions are required when these milestones are not being reached.

The recently published French EPIPAGE-2 study, Etude Epidemiologique sur le Petits ages Gestationnels, has provided a major contribution to our current-day understanding of what happens to preterm infants[3]. The other large European follow-up studies of preterm infants that have been conducted are the UK[4]–*Epicure*, Belgium[5]–*Epibel*, Sweden[6]-*Express* and Norway[7].

EPIPAGE-2 is a longitudinal, population based cohort program in all maternity hospitals across 25 French regions. France has 696,000 births annually, the second highest in Europe behind Germany. EPIPAGE- 1 was the previous French longitudinal study[8] of preterm infants born in 1997-1998.

EPIPAGE-2 commenced in March 2011. It recruited infants born at 22-26 weeks, 27-31 weeks, and 32-34 weeks. A total of 3,083 of these infants have been comprehensively assessed at age 5 years. The assessments were performed in 110 centres specifically opened for the study. EPIPAGE is one of the largest population based studies of its kind on the outcome for preterm infants.

The assessment consisted of an interview with the parents, a self-administered questionnaire, a clinical paediatric examination, and a psychology assessment. The domains examined were motor, sensory, cognitive and behaviour. There is a special mention of working memory because of its importance in learning. It is described as the small amount of information that can be held in the mind and used in the execution of tasks. The function is located in the pre-frontal cortex. Problems with working memory lead to difficulties in learning. A good working memory is related to good performances in literacy and numeracy.

When reporting outcomes for preterm infants, the gross motor function, cognitive abilities, and sensory impairments are important. However, an emerging priority is the impact of minor disabilities on the child's education.

Infants with major white matter injury had the highest rates of neurodevelopmental deficits. In preterm infants with normal cranial ultrasound findings, cognitive delay were the most frequently encountered problems. It is postulated that there are impaired development of the dendritic connections and cortical/subcortical circuits in the cerebral cortex and basal ganglia. It is known that preterm children use different circuits for auditory language processing at school age than term controls.

The authors have previously reported that the presence of major white matter injury (WMI) is associated with deficit rates in excess of 50%.

The EPIPAGE-2 study confirms that adverse outcomes are related to lower gestational age. The authors set out their findings according to 3 gestation categories – 24-26, 27-31, 32-34 weeks.
At age 5 years, almost all of the children were attending school. The number requiring additional school support ranged from 27% for the 24-26 weeks group, 14% for the 27-31 weeks group, and 6% for the 32-34 weeks group.

The moderate/severe neurodevelopmental delays rates were 28%, 19%, and 12% respectively.
The rates of mild neurodevelopmental delay were 38%, 36% and 34% respectively. Those with behavioural problems were included in this category. The behaviour domain included those with hyperactivity, inattention, emotional, and conduct problems. Behavioural problems were a common concern expressed by parents. More than half, whose children were classified as having no neurodevelopmental disabilities, had concerns about their child's behaviour.

The cerebral palsy rate ranged from 8.8% at 24-26 weeks, 5.5% at 27-31 weeks, to 2.4% at 32-34 weeks.

The findings are helpful in the planning of support services for preterm infants. The need for an SNA at school was 20% for those 24-26 weeks gestation, 10% for those 27-31 weeks, and 6% for those 30-34 weeks. The need for a speech and language therapist was 31%, 16% and 14% respectively.

The EPIPAGE-2 study and its findings provide a useful template on how preterm infants are best followed up and cared for.

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The Problem Trainer

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A consistent strand in the literature of medical training worldwide is recognition of a proportion of trainers who engage unchecked in unsupportive and undermining behaviour towards their trainees[1]. Associated with hierarchical structures and traditions, transient work placements, asymmetric power relationships, and fear of retribution for those who complain[2], what is less apparent is emergence of positive solutions and structures.

While the unsupportive and undermining almost certainly represent a minority among trainers, their existence is an open, if unacknowledged and unaddressed, secret in most hospitals in Ireland. This situation been quantified in more formalised study in recent years: while not all bullying of trainees arose from within the medical profession, the results are sobering[3]. Just under half of trainees reported undermining behaviour from a consultant or general practitioner, for one in five occurring on a monthly or more regular basis, and over half reported witnessing a colleague being the victim of bullying or harassment.

Even more troubling is that almost 70% of those who reported being bullied and harassed did not divulge this to an authority figure: of the minority who did, less than one-third report that action was taken. These figures are reflected in a report from one training body which indicated that only two-third of basic specialist trainees felt supported in their posts[4]. The silence of the Intern Networks on the topic to date is notable.

The situation is further complicated by separate entities managing training and employment: postgraduate training bodies and intern networks on one side, and the HSE and its agencies on the other. *Dignity at Work*, the process to deal with bullying for all employees of the HSE and its agencies is problematic for engagement by temporary employees on short placements, and no formal mechanisms exist for coordinated engagement of employer and training body to respond to reports of unsupportive or undermining behaviour. Such conduct may be a cause of concern to hospital management if associated with inadequate out-patient attendance or supervision of post-take ward rounds.

There are also potentially perverse incentives for the institution and clinicians to avoid focussing on the problem – appointing trainees through recognised training schemes streamlines recruitment and removes significant extra work associated with appointing free-standing non-consultant hospital doctors for both clinicians and human resources departments. A final complexity is the difficulty of removing trainer privileges and substituting replacement trainers in rotations of posts of short duration.

Responses in other jurisdictions seem to work from the premise of the virtuous trainer, and are marked by a focus on supportive structures for trainers[5]. This is mirrored by the development of more systematic trainee feedback and trainer support resources by a number of Irish postgraduate training bodies. These are welcome but fail to address the fact that some doctors, for a variety of reasons from learned behaviour, distraction by private practice, personality or unsuitability for the role, are simply not appropriate to undertake the trainer role, even with support and remediation. This aspect is neglected in the medical literature: amid many papers on the 'problem trainee', there is an extraordinary lack of attention to the problem trainer[6].

A perceptive overview of the root causes points to a culture based on a physician ethos favouring individual privilege and autonomy—values that if unchecked can lead to disrespectful behaviour. This behaviour underlies the dysfunctional culture that permeates health care and stymies progress in its resolution[7]. This culture is compounded by the tendency of doctors to avoid confronting dysfunctional practice of which they are aware in their own hospitals, as evidenced in the Lourdes Hospital Inquiry[8], almost certainly a global phenomenon.

Proposed actions by the Medical Council do not yet address the realities of the problem sufficiently. One was the Civility Project, in which two training bodies were funded by the HSE National Doctors Training Programme to undertake a project to gain a better understanding of incivility in a hospital setting with a view to developing a suitable programme of improvement to promote civility. Unfortunately, this project was halted in early stages without any outcome, or indication of a further similar project to continue this work.

The current processes of training bodies and employers are not yet developed for managing unsupportive and undermining trainers, and require radical review and coordination – a trainer who is unsupportive to interns is also likely to display similar patterns of behaviour to basic and higher specialist trainees, and other staff. Removal of training status alone may expose even more vulnerable staff, such as those originating from outside Ireland in free-standing posts, to the inappropriate behaviour.

At a national level intensive work is needed immediately between training bodies, employers, the IMO and IHCA, and the Medical Council on addressing realistic and comprehensive frameworks for preventing, detecting and managing unsupportive and undermining trainers. A key underlying issue is that of culture change, using approaches that address both positive and negative values and behaviours, with an emphasis on fairness: seniority should not confer any protection from scrutiny. A look-back survey of previous trainees would be helpful in identifying problem services and contexts, given that these colleagues no long fear retribution and benefit from experience of a range of services. A palette of resources and responses may be of use, such as mandatory attendance at remediation courses and an ombudsman role.

However, given that disruptive behaviour is also a significant patient safety issue[9], individual institutions should not await such national consensus to start actively promoting a clearer profile of intolerance for unsupportive and undermining conduct. A hospital that offers no official and transparent response to such behaviour quickly loses its moral authority, degrading opportunities for emphasizing strengths and positive features to bring about culture change[10]. Medical Boards, hospital boards, clinical directors and executive management teams should place elimination of this conduct overtly on their agendas, clearly signalling seriousness of intent to all staff, including trainers and trainees. They should prepare appropriate processes and demand regular focussed feedback from training bodies and networks. Our trainee colleagues are the vital lifeblood of our present and future health service and deserve no less.

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Patient and Doctor Attitudes Towards Obesity in Pregnancy

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Abstract

Aim

This study aimed to assess antenatal patients' knowledge of the risks associated with obesity in pregnancy and to identify factors that hinder communication between patients and doctors on this issue.

Methods

Qualitative surveys were circulated to women at their booking visits and to doctors working in the unit.

Results

76 women and 20 doctors were recruited to the study. 58% (n=44) of women were overweight and 25% (n=19) were obese. Most women (82%, n=62) reported being aware of the risks associated with obesity in pregnancy. 8% (n=6) said they would be upset if a doctor addressed their weight with them; however, the preferred healthcare provider to address weight was a midwife. Women preferred to receive information from a healthcare provider than a leaflet or online source. 70% (n=14) of doctors did not address weight unless the woman's BMI was >34.9kg/m2. The most common reason for not addressing weight was not wanting to upset the woman (20%, n=4), however only 35% (n=7) of doctors were aware of services available to offer to obese women.

Conclusion

Women want healthcare providers to address weight management with them. Doctors should be proactive in discussing obesity and be able to provide appropriate support measures for obese obstetric patients.

Introduction

Obesity is the one of the most common medical conditions in women of reproductive age. Obesity is most commonly classified according to the World Health Organisation (WHO) categorisation of body mass index (BMI), with a BMI of >34.9kg/m^2 classified as obese[1]. According to the Royal College of Obstetricians and Gynaecologists[2], 21.3% of the antenatal population are classified as obese and fewer than half of pregnant women (47.3%) have a BMI within the normal range. A recent study in an Irish maternity hospital showed that maternal obesity rates rose from 16% in 2010 to 18.9% in 2017[3]. According to the HSE and Institute of Obstetricians and Gynaecologists' Clinical Practice Guideline on Obesity in Pregnancy[4], studies in Galway from 2008 and 2010 found 25% of women to be obese at their booking visit, and a prevalence of Class III obesity (BMI > 39.9 kg/m^2) of 1.8%. Obesity is associated with significant risks in pregnancy; gestational diabetes, macrosomia, difficult vaginal delivery, increased risk of Caesarean section, wound infection, miscarriage, as well as long-term risk of diabetes and heart disease in the mother and risk of childhood obesity for the baby[4,5].

Studies have suggested that healthcare professionals are inconsistent in addressing weight gain with antenatal patients[6,7,8]. A recent systematic review carried out in King's College London[9] showed that despite women expecting the risks of obesity in pregnancy to be raised with them in early pregnancy, the topic was often avoided by both women and their healthcare professionals. A qualitative study by Flannery et al[10] reported that overweight and obese women felt that they were not provided with sufficient information regarding a balanced diet by healthcare professionals. Other studies have shown that women are using publications from the health service, TV programmes, the Internet and their peers as the main sources of information on weight management in pregnancy[11,12], but often report the information to be confusing and contradictory.

The aim of this study was to assess antenatal patients' knowledge of their weight and of the risks associated with obesity in pregnancy. We wanted to determine whether women think it is appropriate for their obstetric team to address the topic of obesity with them. We also wanted to assess clinicians' willingness to discuss the issue with women and to determine the factors that prevent clinicians from discussing the issue, with the ultimate aim of improving the communication between clinicians and patients on this issue.

Methods

This was a qualitative cross-sectional study carried out over a two month period from November to December 2019 in the antenatal outpatient clinic in University College Hospital Galway. A survey was developed in accordance with the AMEE Guide no. 87 (*Developing questionnaires for educational research)*[13], using a combination of structured and non-structured question formats. Participants were recruited opportunistically by face-to-face methods by asking at their booking visit if they wished to take part in the study.

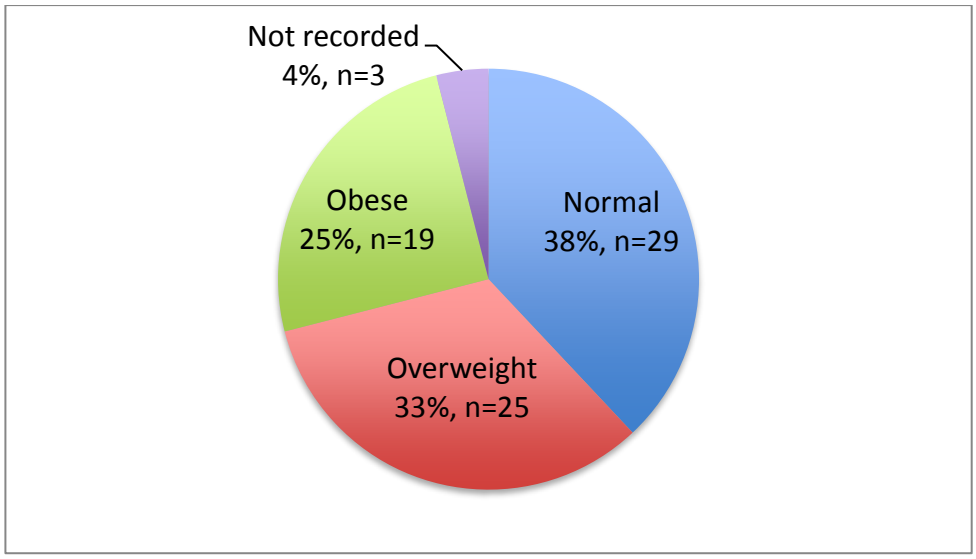
An information leaflet and written consent form were provided. Those who chose to participate were given a survey which they were asked to fill out and return to midwifery staff in the clinic. Midwifery staff then recorded the woman's height and weight and calculated their BMI, which was recorded on the survey. All BMIs were included in the study. The only exclusion criteria was being below the age of 18. A second survey was developed using the same method and given to medical staff working in the obstetric department. Ethics approval was obtained from the Ethics committee of UCHG.

Results

76 patients and 20 doctors were recruited to the study.

BMI distribution is represented on Chart 1. 25% (n=19) of booking women were obese, with a prevalence of class III obesity of 2.6% in comparison with a rate of 1.8% in 2010[4]. Of the obese women (n=19), 13 (68%) had a BMI of >29.9 kg/m^2 (class I obesity), 4 (21%) had a BMI of >34.9 kg/m^2 (class II obesity) and 2 (11%) had a BMI of >39.9 kg/m^2 (class III obesity). Only 3 (16%) obese women reported being aware of their BMI.

Chart 1: *BMI distribution amongst booking women.*



These figures are similar to the RCOG figures, which reported a 21.3% obesity rate and 47.3% normal BMIs. The percentage not recorded is due to human omission of BMI on survey forms.

71% (n=54) of women reported being aware of their weight, 92% (n=70) reported being aware of their height, but only 22% (n=17) were aware of their BMI. Of this 22%, 7 (41%) had a normal BMI, 5 (29%) were overweight, 2 (12%) were obese and 3 (18%) women believed they had a normal BMI but were overweight once BMI was calculated.

82% (n=62) of women reported being aware of the risks associated with obesity in pregnancy. The main risks and the percentage of women who reported being aware of each risk are shown in Table 1.

Risk	% aware	n=
Gestational diabetes	88	67
High blood pressure/pre-eclampsia	79	60
Long-term risk of diabetes, cardiac disease in mother	70	53
Difficult vaginal delivery	59	45
Macrosomia	57	43
Increased risk of Caesarean section	50	38
Childhood obesity in baby	50	38
VTE	49	37
Problems with diagnostic tests (USS, CTG)	45	34
Anaesthetic complications	42	32
Sleep apnea	38	29
Increased risk of wound infection in the case of CS	37	28
Miscarriage	30	23
Preterm birth	17	13
Post-partum haemorrhage	16	12
Difficulty with breast-feeding	11	8
Stillbirth	9	7
Neural tube defects	8	6

Table 1: *Percentage of patients aware of the association between obesity and each perinatal risk.*

Women demonstrated good awareness of the risks of gestational diabetes, high blood pressure and long-term health effects in themselves. Less than half were aware of the increased risk of VTE and Caesarean wound infection, significant causes of perinatal morbidity and mortality. Problems with diagnostic tests, an issue encountered regularly by healthcare providers in caring for the obese pregnant population, were not well recognised as a risk by women.

99% (n=75) of women believed it was appropriate for their obstetrician to address weight management with them. 8% (n=6) said they would be upset if their obstetrician or midwife addressed their weight with them. Of these women, two had a normal BMI, two were overweight and two were obese (class 1).

In terms of preferred healthcare provider to speak to about weight management, the most popular response from women was a midwife (72%, n=55), followed by a dietician (54%, n=41), their GP (47%, n=36) and lastly an obstetrician (28%, n=21). The identification of midwives as the most popular healthcare providers to do this is in keeping with previous studies[14]. The preferred method of communication on this issue was a healthcare provider speaking to them (71%, n=54), followed by a leaflet (32%, n=24) and online information (18%, n=14).

In the survey circulated amongst obstetric staff, 90% (n=18) of doctors reported that they check the patient's BMI at their booking visit. Most doctors (70%, n=14) did not address weight management unless the woman had a BMI of greater than 34.9kg/m^2; 30% (n=6) reported speaking to women with a BMI of >29.9kg/m^2 and only 5% (n=1) reported speaking about it to women with a BMI of >24.9kg/m^2.

The most common reason for not addressing weight management was not wanting to upset the woman (20%, n=4). Other reasons included being unsure what advice to give the woman (10%, n=2) and lack of knowledge about obesity in pregnancy (5%, n=1). Only 35% (n=7) of doctors were aware of the services available in the hospital to offer to overweight women.

The most common risks and the percentage of doctors who mention these risks are shown in Table 2.

Anaesthetic complications	**65**	**13**
Increased risk of wound infection in the case of CS	65	13
High blood pressure/pre-eclampsia	50	10
VTE	50	10
Postpartum haemorrhage	45	9
Difficult vaginal delivery	40	8
Increased risk fo Caesarean section	40	8
Problems with diagnostic tests	35	7
Long term risk of diabetes, cardiac disease in mother	30	6
Childhood obesity	15	3
Miscarriage	15	3
Neural tube defects	15	3
Preterm birth	10	2
Stillbirth	10	2
Sleep apnea	5	1

Table 2: *Percentage of doctors who inform obese patients of the specific perinatal risk associated with obesity.*

Predictably, doctors are most likely to inform obese patients about the increased risk of gestational diabetes and macrosomia. There is a discordance between the number of doctors who report informing patients of the increased risk of wound infection and the percentage of patients who are aware of this risk. Only 50% of doctors inform obese patients about the increased risk of VTE, despite VTE being the leading cause of direct maternal death[15].

Patient comments were sought. There were a number of comments confirming that women see this as an important issue for their healthcare providers to address: "Immoral not to address it", "role and responsibility to fully inform patients of health implications", "a duty to tell the mother and give her support". One woman reported that "it would be helpful to know how much/little weight should be gained". Another felt that obesity was an issue that should be addressed before pregnancy.

Feedback from doctors identified a need for dietician facilities and structured weight management mechanisms. One participant mentioned not stressing the risks enough as patients are “already conscious of their weight”.

Discussion

Obesity is a steadily rising health issue for the pregnant population. Pregnant women want their healthcare providers to discuss weight management with them, and it is the duty of an obstetrician to have the knowledge and communication skills required to discuss the risks associated with obesity in pregnancy. The MBRRACE-UK Saving Lives, Improving Mothers' Care report for 2020 shows that cardiac disease and thromboembolism – both of which have obesity as a risk factor – remain the leading cause of indirect and direct maternal death respectively, and more than half the women who die are overweight or obese[15]. This clearly indicates the significance of obesity for the obstetric population and the need to take action to reduce the morbidity and mortality associated with it. Patient-doctor communication is an essential part of this.

While women in this study demonstrated an awareness of some of the risks of obesity on pregnancy, there were many risks that were less well-recognised. Women demonstrated good awareness of the risks of gestational diabetes, high blood pressure and long-term risks for the mother; however, less than half recognised the difficulty associated with diagnostic tests and only 37% were aware of the increased risk of wound infection, some of the common problems encountered by healthcare professionals looking after obese patients. Despite the leading role of VTE as a source of maternal morbidity, only 49% of women were aware of the association between VTE and obesity. This indicates a need for better patient education on the risks of obesity going forward.

Only 11% of obese patients were aware of their BMI category. In order for obese women to engage properly with this issue and to recognise the increased risks they face; it is essential that they are aware of their weight and BMI. While obstetricians can relay weight and BMI at a booking visit, this is often regarded as being too late. The MBRRACE-UK report calls for public health actions to “reduce our obesogenic environment and address weight management before patients enter pregnancy”[15], and there is a clear role for general practitioners in pre-conception counselling for these women.

Two opportunities for improving communication from obstetricians were identified in this study. Firstly, the main reasons for not addressing the topic of weight were a lack of knowledge and comfort in addressing obesity/weight management in pregnancy. A recent systematic review by Callaghan et al[16] found a “substantial gap” in healthcare professionals’ knowledge of gestational weight gain recommendations and called for action to improve this deficiency by educating midwives and obstetricians. Our findings support the need for training for obstetricians in this area.

The Institute of Medicine issued recommendations in 2009 on optimal gestational weight gain based on pre-pregnancy BMI[17] – however, numerous studies have suggested the targets for obese women are too high, and that obese women should maintain or lose weight during pregnancy[18,19]. Further research is needed to develop clear guidance on gestational weight management for obstetricians and pregnant women, taking into account nutritional as well as caloric food content and physical activity.

Secondly, obstetricians were generally only likely to address the issue of weight with women with BMI of >34.9kg/m^2. A meta-analysis of European, North American and Australian cohorts[20] published in 2019 showed that obese women with high gestational weight gain have been shown to be at the highest risk of pregnancy complications, making it essential that these women are identified and provided with information regarding gestational weight gain and risks. However, the study also showed that low and high gestational weight gain amongst normal weight mothers was associated with a higher risk of pregnancy complications. This indicates that a discussion regarding gestational weight management should take place with all women in the course of their antenatal care.

A randomised controlled trial in 2018[21] looked at 'healthy conversation skills' as a way to support behaviour change around gestational weight gain. The study showed that those in the intervention group gained less weight and felt more supported, demonstrating use of healthy conversational skills as an acceptable way to support lifestyle changes in pregnancy. However, time constraints mean that this is not always a feasible approach. Use of the FIGO Nutrition checklist[22] has been suggested as a relatively fast and straightforward method of broaching the topic of nutrition and gestational weight management. A qualitative study conducted in a tertiary maternity hospital in Dublin found that women regarded the checklist as a quick and appropriate intervention[23]. Obstetricians surveyed felt using the checklist meant they talked about nutrition and weight more than they would normally – however, they also felt there was insufficient time to discuss it as part of a standard antenatal visit[24]. Going forward, methods such as use of smartphone applications in combination with a behavioural-lifestyle intervention may provide additional, time-efficient support to women and obstetricians to improve diet quality and physical activity in pregnancy[25].

A key area for future work on this topic would be to survey the multi-disciplinary team involved in the care of obese obstetric patients, including midwives, dieticians, general practitioners and physiotherapists, in order to ensure a collaborative approach to addressing obesity in pregnancy.

Declaration of Conflicts of Interest:
The authors have no conflict of interest to declare.

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Influence of Cost on Contraceptive Choices Amongst University Students

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Abstract

Introduction

Cost remains a major barrier in accessing effective contraception especially long-acting reversible contraception. This study sought to assess the current contraception choices amongst university students including the influence of cost on choices.

Methods

A cross-sectional study of Irish university students at University College Cork was undertaken. The online survey examined current contraception use, justifications for this choice of contraception and the effect that hypothetical provision of free contraception would have on their choices.

Results

A total of 1,840 sexually active students completed the online survey. Condoms were used by 1,020 students (55.4%), the combined pill was used by 729 (39.6%) and 'coitus interruptus' was used by 169 students (9.1%). Statistically males were more likely to spend under €50 annually (47.6%, n=182 of 382, p<0.001) and female students were more likely to spend over €100 on contraception (41.2%, n=470 of 1,141, p<0.001).By removing cost, 394 (34.3%) sexually active women would definitely change contraception, with another 250 women (21.8%) considering changing.

Discussion

Students often rely on unreliable or user-dependent methods of contraception. Our study has demonstrated that cost influences contraceptive choice with nearly half of the women surveyed stating they would change contraception if cost was removed.

Introduction

In Ireland, currently one in seven pregnancies is perceived as a crisis pregnancy[1]. With recent changes in Irish legislation permitting termination of pregnancy up to twelve weeks gestation[2], prevention of unplanned pregnancies has received renewed attention. The Citizen's Assembly on the Eighth Amendment raised concerns over the cost of contraception in Ireland and its potential prohibitive effects to contraception use[3].

Access to contraception is an international problem[3, 4], with women aged under 25 are most at risk of an unplanned pregnancy, and typically use less reliable forms of contraception[1, 5]. Difficulty accessing contraception increases the likelihood of unprotected sexual intercourse (UPSI)[6]. Cost was cited as a barrier by 17-24 year olds in Ireland to using condoms or the combined oral contraceptive pill (COCP)[1]. Lally et al, highlighted that condoms, the COCP and coitus interruptus were the main contraceptives used among Irish students in 2015[7]. Condom use was reported by 89% of the student population, however their use was inconsistent, as 69% of students reported recent UPSI[7]. Non-use of contraception remains the leading reason for requiring emergency contraception amongst students[(8, 9)].

The costs associated with long-acting reversible contraceptives (LARCs) affect their uptake[10-12]. LARC uptake has been shown to be inversely proportional to its cost[13], once it rises above $200, uptake decreases from 87% to 27%[10]. The CHOICE study highlighted if cost was removed entirely, LARC uptake increased to 67%[12], with 48% selecting a hormonal intrauterine system (Mirena®/Jaydess®/Kyleena®)[12]. In 2013, Gyllenburg et al demonstrated that it was cost effective to provide free LARCs, as the reduction in unplanned pregnancies reduced government expenditure on providing terminations.[14]. LARC uptake was highest among women aged under 25, evidencing their unmet need for contraception[14].

Despite several campaigns, students' use of contraception can be unreliable and inconsistent[8, 15]. The aim of this study was to assess current contraceptive usage amongst students in University College Cork (UCC), as well as the factors influencing their choice of contraception, in particular the effect cost has on their contraceptive choices.

Methods

This study was conducted in UCC, which has the second largest full-time undergraduate enrolment in the Republic of Ireland[16], with nine colleges providing over 120 courses[17]. In this study, the colleges were grouped into; '*Science, Engineering and Food Science'*, '*Medicine and Health*', '*Arts, Celtic Studies and Social Science*' and '*Business and Law'*. At the time of the study, UCC had 21,894 undergraduate and postgraduate students[16]. An online questionnaire was distributed to all students with an active UCC email in September 2018 via the UCC email modulator. The email contained information regarding the aim of the survey, the data that would be collected plus a link to complete the survey using SurveyMonkey®.

Contact information of the study co-ordinators was provided in the email and consent to participate was obtained by clicking the link to complete the survey. All data was collected anonymously. As an incentive, all students who completed the survey were entered into a draw for a €100 One for All® voucher to increase the response rate.

The survey consisted of twenty-eight questions divided into three sections. The first section collected demographic data including age, relationship status, area of study as well as whether the student had previously been sexually active or not. Students who reported previously being sexually active were asked if they had been so in the previous six months or not. Data surrounding students' funding of both medical bills and contraceptive costs was collected.

The second section assessed current contraception use, including reasons for their current contraceptive choice along with estimated annual contraceptive expenditure. The list of factors influencing contraceptive choices was based on previously published papers[11, 12]. Students were asked to rank the following factors; '*cost*', '*efficacy*', '*non-contraceptive benefits', 'side effects', 'having regular menses', 'STI prevention', 'availability', 'healthcare providers' opinion', 'partner's opinion', 'reversibility*', *'forgettability'*, *'friends/family's opinion', 'not having an irregular period', 'nobody knows you're using it'*. Students were asked if they would change contraceptive if cost was removed. The response options included '*definitely change*', '*consider changing*' or '*would not change*'. If they elected to change, students were asked which of the following they would choose; '*combined oral contraceptive*', '*Mirena®/Jaydess®*', '*progesterone only pill*', '*implant*', '*diaphragm/ring*', '*copper coil*', '*patch*', '*depo*' or ' *a form of long-acting contraception*'. This list was not exhaustive but contained the most popular long-acting and short-acting contraceptives in use in Ireland[11].

Ethical approval was obtained from the UCC Clinical Research and Ethical Committee in May 2018(ECM (4)f 05/06/18). Online responses were collected over a period of a week following the distribution of the email containing the study information and survey. Data analysis was conducted using IBM SPSS Version 25®. Descriptive statistical analysis was performed to ascertain the demographics of the population that responded. Age was grouped into those aged 18-20, 21-24 and those aged over 25. Chi-squared tests were performed to assess the associations with cost, reliability, access on the students' choice.

Results

In total, 2,079 students completed the online survey with 1,840 of them being sexually active, giving an overall response rate of 9.5%. Demographic data are outlined in Table 1. The majority of the respondents were female (73.7%, n=1,532), and were aged between 18-24 years (79.2%, n=1,664) with a relatively even distribution across the different areas of study.

Table 1: *Demographic Data.*

	Previously Sexually Active n (%)	Never Sexually Active (n)
Gender		
Male	479 (26.2%)	50 (21.6%)
Female	1348 (73.8%)	182 (78.4%)
Age in years		
Under 18	0 (0%)	1 (0.4%)
18-20	627 (34.2%)	127 (53.6%)
21-24	818 (44.7%)	90 (37.9%)
Over 25	388 (21.2%)	19 (1.1%)
Relationship Status		
In a relationship	1,042 (56.8%)	22 (9.3%)
Single	794 (43.2%)	215 (90.7%)
Area of Studying		
Science & Engineering	527 (28.7%)	71 (29.9%)
Medicine & Health	452 (24.6%)	71 (29.9%)
Arts, Celtic Studies & Social Sciences	528 (28.7%)	64 (27%)
Business & Law	332 (18%)	31 (13.2%)
Type of Degree		
Undergraduate	1,432 (77.9%)	213 (89.9%)
Diploma	42 (2.3%)	0 (0%)
Apprenticeship	0 (0%)	1 (0.4%)
Masters	227 (12.3%)	15 (6.3%)
PhD	113 (6.1%)	6 (2.5%)
Other	25 (1.4%)	2 (0.8%)

Students were asked to select all forms of contraception they currently used. Contraceptive choice among sexually active students based on age, gender and relationship status is demonstrated in Table 2, with the diaphragm, patch, Depo-Provera® and sterilisation grouped under '*other contraception'*. The main contraceptives used by sexually active students (n=1840), in order of popularity, were; condoms (55.4%, n=1,020), the COCP (39.6%, n=729) and coitus interruptus (9.1%, n=168). The use of LARCs (Implanon®/Copper Coil®/IUS (Mirena®/Jaydess®)) was low, only being used by 11.5% (n=213) of sexually active students. Emergency contraception was used by 4.4% (n=81) as contraception.

Table 2: *Contraceptive Choices based on age, gender and relationship status (*= p<0.05).*

	Overall n (%)	**Age n (%)**			**Relationship Status n (%)**		**Gender n (%)**	
		18-20	*21-24*	*Over 25*	*In relationship*	*Single*	*Male*	*Female*
COCP	729 (39.6)	259 (35.8)	342 (47.2)	123 (17)	458 (63.0)*	269 (37.0)*	143 (19.8)*	581 (80.2)*
Condoms	1020 (55.4)	388 (38.2)	452 (44.5)	175 (17.2)	508 (49.8)*	512 (50.2)*	302 (29.8)*	712 (52.8)*
POP	108 (5.9)	37 (34.3)*	58 (53.7)*	13 (12.0)*	54 (50.0)	54 (50.0)	21 (19.6)	86 (80.4)
Coitus Interruptus	168 (9.1)	59 (35.1)	75 (44.6)	34 (20.2)	114 (67.9)*	54 (32.1)*	49 (29.2)	11 (70.8)
Implanon	125 (6.8)	48 (0.7)	58 (0.1)	19 (0.9)	73 (58.4)	52 (41.6)	22 (17.6)*	103 (82.4)*
IUS	58 (3.2)	10 (17.2)*	27 (46.6)*	21 (36.2)*	41 (70.7)*	17 (29.3)*	8 (14.0)*	49 (86.0)*
Copper Coil	30 (1.6)	4 (13.3)*	14 (46.7)*	12 (40.0)*	20 (71.4)	8 (28.6)	9 (30.0)	21 (70.0)
Other contraception	38 (2.1)	8 (21.0)	10 (26.3)	20 (52.7)	30 (78.9)	8(21.1)	8 (21.1)	30 (78.9)
Cyclical Method	41 (2.2)	10 (24.4)	17 (41.5)	14 (34.1)	28 (68.3)	13 (31.7)	12 (30.0)	28 (70.0)
Emergency Contraception	81 (4.4)	27 (33.3)	41 (50.6)	13 (16.0)	33 (40.7)*	48 (59.3)*	23 (28.7)	57 (71.3)
Unsure of which method	16 (0.9)	5 (31.3)	5 (31.3)	6 (37.5)	6 (37.5)	10 (62.5)	11(68.8)*	5 (31.3)*
No Contraception	80 (4.3)	29 (36.3)*	23 (28.7)*	28 (35.0)*	37 (46.3)	43 (53.8)	29 (36.7)*	50 (63.3)*

Relationship status influenced the contraception used, with LARCs used more by those in relationships (63.3%, n=142 versus 36.3%, n=81). Students in relationships were also statistically more likely to use coitus interruptus as their method of 'contraception' (67.9%, n=114 versus 32.1%, n=54; p<0.001). Condoms were more popular among single students (50.2%, n=512 versus 49.8%, n=508; p<0.001), as was emergency contraception (59.3%, n=48 versus 40.7%, n=33; p<0.001). Using no contraception was relatively evenly distributed between those in a relationship versus single students (46.3%, n=37 versus 53.8%, n=43, p<0.052).

Table 3: *Reasons for using contraception.*

	Reasons					
	Stop Pregnancy n (%)	*p Value*	*Delay pregnancy n (%)*	*p value*	*Protect against STIs n (%)*	*p value*
COCP (n=729)	514 (70.5%)	<0.001	233 (32%)	<0.001	270 (37%)	<0.001
Condoms (n=1020)	742 (72.7%)	<0.001	267 (26.2%)	<0.001	572 (56.1%)	<0.001
IUS (n=58)	39 (67.2%)	0.12	15 (25.9%)	0.58	8 (13.8%)	<0.001
Implanon (n=125)	88 (70.4%)	0.02	44 (35.2%)	0.02	34 (27.2%)	0.19
Copper Coil (n=30)	24 (80%)	0.01	8 (26.7%)	0.62	8 (26.7%)	0.45
Cyclical Method (n=41)	28 (68.3%)	0.15	9 (22%)	0.88	21 (51.2%)	<0.001
Coitus interruptus (n=168)	118 (70.2%)	<0.001	52 (31%)	<0.001	68 (40.5%)	0.02
No contraception (n=83)	23 (27.7%)	<0.001	6 (7.2%)	<0.001	25 (30.1%)	0.64
Emergency contraception (n=81)	61 (75.3%)	<0.001	22 (27.2%)	0.34	48 (59.3%)	<0.001

Table 3 highlights the main reasons for using the most popular contraceptives. Prevention of unintended pregnancy was the main reason cited for using condoms (72.7%, n=742 of 1,020, p<0.001), coitus interruptus (70.2%, n=118 of 168, p<0.001) and emergency contraception (75.3%, n=61 of 81, p<0.001). Delaying pregnancy rather than stopping pregnancy was cited more by students using the COCP (70.5%, n=514 of 729, p<0.001). *'STI Prevention'* was given as a reason for using emergency contraception by 59.3% (n=48 of 81, p<0.001). Amongst those who relied on coitus interruptus, 40.5% (n=68 of 168, p<0.02) of them believed it offered STI protection.

Personal monies were used by 70% (n=1,288 of 1,823) of students to finance their contraception, with only 11.8% (n=217 of 1,823) using a medical card. Gender influenced how students funded their contraception and their annual contraception costs. Male students were statistically more likely to pay for contraception using personal finances (89.1%, n=425 of 477 versus 63.8%, n=859 of 1,346, p<0.001) but were also more likely to receive financial support from their partners (6.3%, n=30 of 477 versus 4.5%, n=60 of 1,346, p<0.001). Female students were more likely to receive parental support in paying for their contraception (12.6%, n=170 of 1,346 versus 0.8%, n=4 of 477, p<0.001). Statistically males were more likely to spend under €50 annually (47.6%, n=182 of 382, p<0.001) and female students were more likely to spend over €100 on contraception (41.2%, n=470 of 1,141, p<0.001).

Questions regarding whether students would change contraceptive if cost was removed, as well as selecting their preferred contraceptive were included in the survey. Of the 1,149 sexually active females who responded to the question, 34.3% (n=394) would definitely change and 21.8% (n=250) would consider changing. Older students were less likely to change contraception with 53.3% (n=121 of 227, p<0.001) not changing. A third of those aged 18-24 would definitely change (36.2%, n=331 of 913, p<0.001) while a further 22.6% (n=207 of 913, p<0.001) would consider changing. The type of contraceptive students would choose is highlighted in Table 4.

Table 3: *Contraceptive students would change to if the cost was removed.*

Current Contraception	**Contraception students would change to**								
	COCP n(%)	*POP n(%)*	*Implanon n(%)*	*Copper Coil n(%)*	*IUS n(%)*	*Depot n(%)*	*Patch n(%)*	*Diaphragm/ Ring n(%)*	*LARC n(%)*
COCP (n=723)		18 (1.2%)	214 (14%)	107 (7%)	61 (4%)	5 (0.3%)	30 (2%)	24 (1.6%)	134 (18.5%)
POP (n=108)	6 (5.6%)		16 (14.8%)	12 (11.1%)	5 (4.6%)	0 (0%)	1 (0.9%)	24 (1.6%)	26 (24.1%)
Condoms (n=1003)	151 (15.1%)	13 (1.3%)	141 (14.1%)	71 (7.1%)	38 (3.8%)	2 (0.2%)	19 (1.9%)	22 (2.2%)	167 (16.7%)
Copper Coil (n=29)	2 (6.9%)	1 (3.4%)	2 (6.9%)		0 (0%)	0 (0%)	1 (3.4%)	0 (0%)	2 (6.9%)
IUS (n=58)	0 (0%)	0 (0%)	1 (1.7%)	0 (0%)		0 (0%)	1 (1.7%)	0(0%)	6 (10.3%)
Implanon (n=121)	8 (6.6%)	2 (2.5%)		6 (5%)	5 (4.1%)	0 (0%)	1 (0.8%)	0 (0%)	14 (11.6%)
Depo (n=12)	0 (0%)	1 (8.3%)	0 (%)	2 (16.7%)	2 (16.7%)		0 (0%)	0 (%)	2 (16.7%)
Coitus Interruptus (n=164)	19 (11.6%)	2 (1.2%)	20 (12.2%)	21 (12.8%)	5 (3%)	0 (0%)	2 (1.2%)	2 (1.2%)	35 (21.5%)
Emergency Contraception (n=81)	15 (18.5%)	0 (0%)	14 (17.3%)	9 (11.1%)	3 (3.7%)	0 (0%)	1 (1.2%)	1 (1.2%)	16 (19.8%)
Cyclical Method (n=41)	6 (14.6%)	3 (7.3%)	6 (14.6%)	2 (4.9%)	2 (4.9%)	0 (0%)	1 (2.4%)	2 (4.9%)	8 (19.5%)
No Contraception (n=78)	16 (20.5%)	0 (0%)	12 (15.4%)	6 (7.7%)	2 (2.6%)	0 (0%)	1 (1.3%)	0 (0%)	8 (10.3%)

Discussion

This study was one of the largest studies to date examining contraceptive use among Irish university students, including the factors influencing their contraceptive choices. Consistent with other studies of university students[15, 18, 19], it shows that Irish students rely on either user-dependent or unreliable contraceptive methods. Prevention of pregnancy was the main reason for contraception use followed by STI protection, similar to other studies[7].

Consistent with Irish[7] and international studies[5, 15, 19], condoms and the COCP remain popular. UCC students' condom usage was lower, at 55.4%, compared to Lally et al's rate of 89%[7]. Irish students are no different to international students; approximately half of Finnish female students use the COCP[15] and 10% of Italian medical students use coitus interruptus as contraception[19]. In our study coitus interruptus was used by 9.1% of students. Misinformation among students remains a barrier to effective contraception use, especially IUDs[(5, 20)]. In our study, 40.5% of those using coitus interruptus, and 59.3% of those using emergency contraception falsely believed it offered STI protection. Similar misconceptions were highlighted by Lally et al in 2015[7]. This demonstrates, that despite several targeted public health campaigns misinformation on contraception and STI prevention still persists. The use of LARCs has not been shown to adversely impact students condom use versus other contraceptives for STI protection, overall dual-method contraception use remains low among young women[21].

In our study, 34.3% of sexually active female students would definitely change contraception if the cost was removed, evidencing that cost is a barrier. Amongst 18-24 year olds, 61.8% would either definitely change or consider changing. It was within this age group that Gyllenburg et al demonstrated an unmet need for contraception[14] and, it is this cohort, that has the highest risk of an unplanned pregnancy in Ireland[1]. Even with subsidised student health services, the upfront cost of a Mirena® was €214 (€20 consultation fee[22], €70 insertion fee[22] and €124 Mirena® with the Drugs Payment Scheme[23]). It is female students who are most vulnerable to these costs and who are more likely to use effective contraception when the cost was reduced[13, 18]. Female UCC students also had a higher financial burden associated with contraception, being significantly more likely to spend over €100 annually on contraception. With the introduction of terminations in Ireland, the cost of accessing contraception has come to the fore. The Citizen's Assembly raised their concerns regarding the prohibitive effect of cost in accessing contraception[3]. The previous Irish Health Minister, Mr Simon Harris, promised free contraception in 2021[24], however this did not materialise in Budget 2021[25].

One of our study's strengths is its sample size; it is one of the largest studies of Irish university students in recent times. However, its broadness, including students from various academic areas and levels of study, means it is not specific to a particular cohort within the University. Our study is one of the first examining university students as an individual population, and it is one of the most recent contraceptive studies after the introduction of abortion in Ireland.

The limitations of our study include its predominately female population. Other factors influencing contraception choices such as previous sexual health education, were not examined within this study. The definition of 'sexually active' was not specifically defined within the questionnaire and may have been misinterpreted by students. Our questionnaire also assumed that students had some basic knowledge of contraceptives and their indications. To reduce the effect of previous sexual education, where possible, colloquial terms were used (e.g. '*the bar'*), and questions were phrased in everyday language.

Students often use unreliable and user-dependent contraceptive methods to protect themselves against STIs and pregnancy. With prevention of unplanned pregnancies remaining a public health concern in Ireland[3], removing the cost associated with LARCs may help to increase their uptake amongst students. The Government's delay in providing free contraception means financial barriers still exist in Ireland today limiting access to effective contraception.

Declaration Conflicts of Interests:
The authors have no conflicts of interest to declare.

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Mapping Mobility and Migration of Psychiatry Trainees

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Abstract

Introduction

Ireland has been synonymous with emigration. However, little is known about the migratory trends of its mental health professionals. This article looked at the patterns and driving forces of short-term mobility and long-term migration amongst psychiatry trainees in Ireland.

Methods

A cross-sectional survey was distributed to psychiatry trainees in Ireland as part of the European Brain Drain study, exploring the patterns and driving forces of short-term mobility and long-term migration.

Results

There were n = 104 respondents. Demographically, the trainees' mean age was 33.8 (SD: 5.7 years) with a female majority (n=62, 64.6%). A quarter of the trainees were non-Irish nationals (n=26, 25%). Many of Ireland's psychiatry trainees have experienced short- and long-term migration. Most trainees (n=93, 90.3%) have 'ever' considered leaving Ireland and almost half (n = 41, 47.7%) have taken 'practical steps' towards migration. Academia and work are integral migration factors.

Conclusion

Ireland is both a donor and host country for psychiatry trainees. Further research focussing on academic and work opportunities, quality of life both at home and work, equality and professional parity of esteem is required to strengthen Ireland's psychiatry workforce.

Introduction

Ireland has been synonymous with emigration[1], with Irish-trained doctors emigrating from Ireland since the 19th century.[2] Migration flows pose challenges to the efficiency and stability of the Irish healthcare system.[3] Importantly, Ireland has one of the highest levels of dependency on international medical graduates in the Organisation for Economic Co-operation and Development (OECD) and also the highest number of Irish-trained doctors working abroad.[3,4]

High rates of emigration among Irish medical school graduates is one of the workforce stressors challenging the medical workforce sustainability in Ireland and the compliance with the World Health Organisation's Code of Practice on the International Recruitment of Health Personnel.[4,5] This Code emphasises that effective health workforce planning, education, training and retention strategies should be implemented to sustain the countries' health workforce and reduce the need to recruit migrant health personnel.[5]

Research looking at the sustainability of Ireland's national health workforce highlights the importance of data when looking at the migratory flows.[4] Currently, apart from the professional registers, the National Employment Record (NER) serves as a single database only for non-consultant hospital doctors (NCHDs) working in the Irish public sector. It was set up to help facilitate medical human resource administrative requirements when NCHDs rotates between jobs. This database identifies nationality, country of training, work permit requirement but does not capture mobility and migration of each individual doctor. Personal data utilisation and protection is governed by the General Data Protection Regulation (GDPR). In mental health, the lack of reliable single source databases affects workforce planning and mental health resource funding.[4, 6]

The European Union free movement of professionals and the automatic recognition of qualifications may contribute to the difficulties in tracking movements of the workforce. In 2018, the Mental Health Services of the Health Services Executive (HSE) set out the task for recruitment and retention to be established following reports that Ireland's mental health workforce was 24% under capacity outlined by Ireland's first mental health policy 'A Vision for Change' (AVFC).[6] However, Ireland's new mental health policy, 'Sharing the Vision' (StV), launched in June 2020 does not address the matter of improving mental health workforce.[7]

Migration is juxtaposed and intertwined with recruitment and retention. The College of Psychiatrists of Ireland (CPsychI) is the training body responsible for selecting and recruiting trainees to fill the available training posts, set by the National Doctors Training and Planning (NDTP) Department of the Health Services Executive (HSE).[8]

Despite the various efforts looking into health professional mobility across Europe, there is little research done focussing on mobility of the mental health workforce, particularly at European level at an early career stage. The aim of this article has been to look at the patterns and driving forces of short-term mobility and long-term migration amongst psychiatry trainees in Ireland.

Methods

An international cross-sectional survey conducted in 33 European countries between 2013 – 2014 was conducted by the European Federation of Psychiatric Trainees (EFPT), an independent, non-profit umbrella organisation for European psychiatric national trainees' associations.[9] The study aimed at assessing the proportion of psychiatry trainees that have already moved country and those who would consider such a move in the future; exploring their reasons to stay and leave the country; reporting the countries where they come from and where they move to and; examining their individual profile, such as demographics and socioeconomic characteristics.[9] The study was given ethical approval by the National Ethics Committee in Switzerland.

The 61-items self-report survey questionnaire covered items encompassing demographics; trainee's attitude towards migration and experiences of short-term mobility (defined as three months up to one year) and of longterm migration (defined as more than a year). Pertaining to attitude towards migration, there were specific set of three hierarchical questions focusing on 'migratory tendency': (i) 'ever' considered leaving (yes/no); (ii) considering leaving 'now', recoded as a dichotomic variable ('strongly agree' or 'agree'=yes, else=no) and (iii) taking 'practical steps' (yes/no), describing an increasing disposition towards future migration. An affirmative answer at each question served as a gateway to the subsequent question.[9]

The survey link was sent to a total of 287 psychiatry trainees registered with the College of Psychiatrists Ireland (CPSYCHI) via email between 2013 and 2014.[9]

Data was analysed using the Software Package for Social Sciences for Windows v. 22.0 (SPSS Inc. Chicago, IL). Descriptive statistics were used to report frequencies and percentages for categorical variables and mean value with standard deviation for continuous variables.[9]

Results

Sample characteristics

A total of 104 trainees completed the survey in Ireland, with a response rate of 36.2%.[9] All trainees were based in Ireland and more than half of the trainees (n = 61, 59.8%) were based in the capital, Dublin. There was a widespread of length of years in training between 1 and 10 years. The salary for the majority of trainees (n=79, 82.2%) was over €2000 per month, but over half (n=54, 56.3%) were dissatisfied or very dissatisfied with their income. The detailed demographics of respondents are reported in Table 1 (next page).

Table 1: *Ireland's Trainees Demographics (n = 104).*

Variables		**N (%)**
Gender	Male	34 (35.4%)
	Female	62 (64.6%)
	Did not disclose	8 (7.7%)
Age		Mean 33.8 [SD (5.705)]
Irish nationals		78 (75%)
Non-Irish nationals		26 (25%)
Africa *(Nigeria, Sudan, South Africa, Botswana and Mauritius)*		19 (18.2%)
Asia *(Pakistan, Malaysia, India and Iraq)*		16 (15.4%)
North America *(USA and Canada)*		3 (2.9%)
South America (*Trinidad and Tobago)*		1 (1%)
Europe *(France, Italy, Poland, Norway, UK and Romania)*		9 (8.8%)
Relationship status	In a relationship	74 (77.1%)
	Not in a relationship	22 (22.9%)
	Did not disclose	8 (7.7%)
Have children	No	60 (62.5%)
	Yes	36 (37.5%)
	Did not disclose	8 (7.7%)
Type of trainee	Adult psychiatry	90 (86.5%)
	Child psychiatry	11 (10.6%)
	Dual training in Adult and Old Age psychiatry	3 (2.9%)
Number of years of psychiatry training	Year 1	24 (23.1%)
	Year 2	18 (17.3%)
	Year 3	8 (7.7%)
	Year 4	16 (15.4%)
	Year 5	5 (4.8%)
	Year 6	11 (10.6%)
	Year 7	3 (2.9%)
	Year 8	8 (7.7%)
	Year 9	2 (1.9%)
	Year 10	9 (8.7%)

Migration Tendencies

Amongst the 104 trainees, two-thirds were Irish nationals (n=78, 75.0%), of which 22 had dual citizenships. There were trainees originating from Africa (n=19), Asia (n=16), Europe (n=9), North America (n=3) and South America (n=1). The details of countries per continent is presented in Table 1.

Less than half (n=47, 45.2%) of the trainees had short-term mobility experiences. Over one third (n=37, 35.6%) experienced long-term migration, with Ireland being listed by 31 trainees as their long-term migration destination. The top two reasons for long-term migration for Ireland's psychiatry trainees were academic (n=28) and work (n=19) related. These reasons were the same for those who had migrated: first, academic (emigrating - 87.6%, immigrating - 78.1%) and second, work (emigrating - 73.1%, immigrating - 72%). The majority of the immigrant trainees (n=21) considered themselves not having equal opportunities workwise (n=17) and academically (n = 13) compared to the native trainees.

Of those with short-mobility experiences, 39 reported these influenced their attitude towards migration, with a preponderance (n=35 out of 39, 89.7%) in favour of migration. The majority of the trainees (n=93, 90.3%) had 'ever' considered leaving Ireland; over three quarters (n = 71, 76.3%) were considering leaving the country 'now' and almost half (n=41, 47.7%) had taken 'practical steps' towards migration. Just over half (n=53, 57%) of the trainees had planned to work in another country, but over two thirds (n = 37, 69.8%) had not made any arrangements to do so.

In terms of forward planning, nearly one-third (n=27, 29.7%) of the trainees thought they would be working in Ireland, and fewer in Europe (n=19, 17.3%) or elsewhere in the world (n=19, 17.3%). Only three immigrant trainees planned to return to their home country 5 years from the time of the survey.

Attractive Job Features

The five most attractive job features for Ireland's psychiatric trainees, which they strongly agreed or agreed on were: pleasant work environment (100%), opportunity to progress professionally (98.1%), good work life balance (97%), high salary (92.2%) and senior staff supervision and support (92.1%) (Figure 1)(next page).

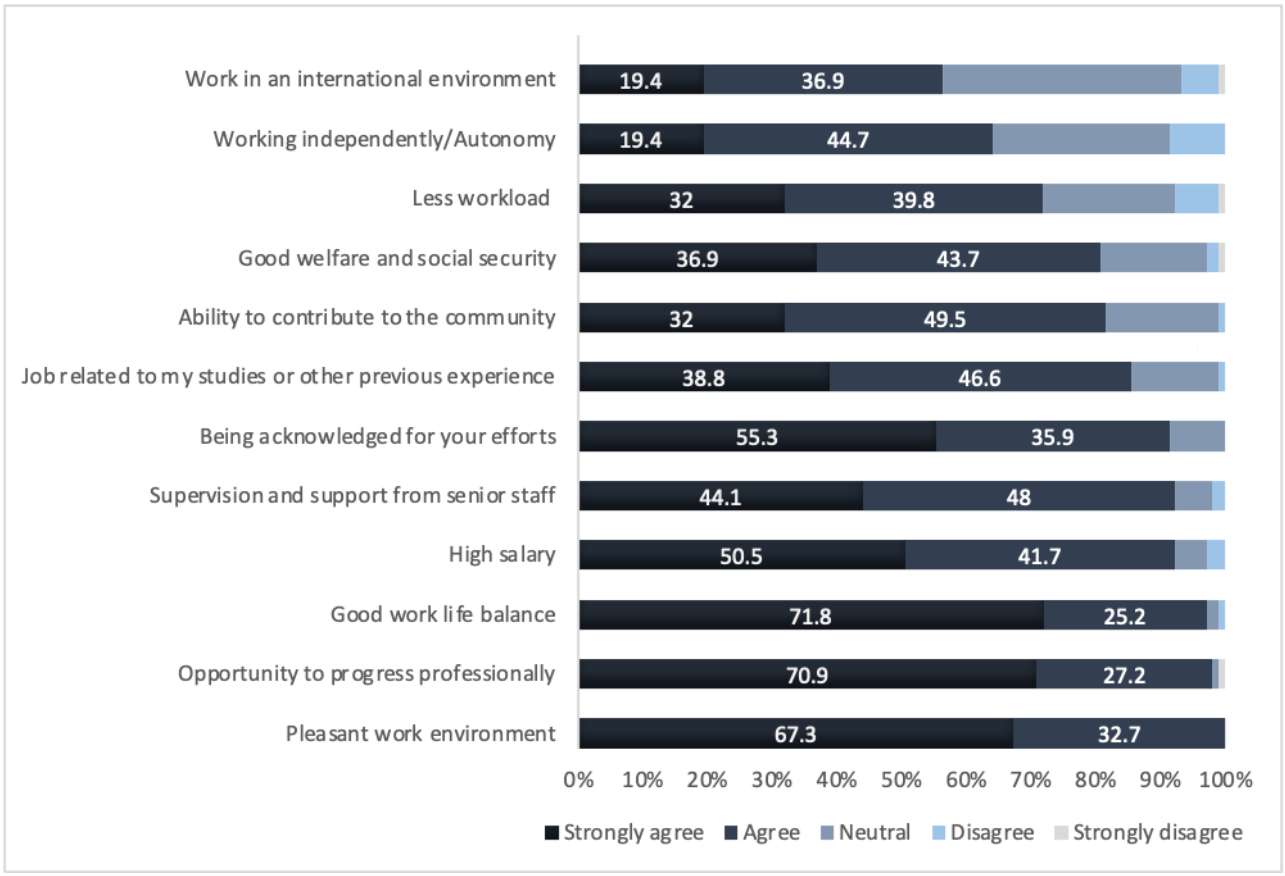

Figure 1: *Attractive Job Features for Ireland's Psychiatric Trainees.*

Discussion

To the best of our knowledge, this is the first study looking at migration trends amongst psychiatry trainees in Ireland. Notwithstanding the age of the dataset, these findings remain apposite and should be further explored considering changes in Irish psychiatry training in recent years.

Demographically, there was a female predominance amongst psychiatry trainees in Ireland, similar to many other European countries.[9, 10, 11, 12] Whilst psychiatry trainees in Ireland were older when compared to the rest of psychiatry trainees in Europe, they were younger compared to the international medical graduates in Ireland, with a mean age of 31.17 and 40 years, respectively.[4, 9, 10, 11, 12]

The overall sample of this Brain Drain study from 33 different countries across Europe reported 13.3% (n = 303) of the European psychiatry trainees were immigrants.[9] In Ireland, a quarter of the psychiatry trainees were non-Irish nationals heeding Ireland's health force reliance on immigration.[4] This is a contrast to other countries' reports from the same study where almost all trainees were from the home country.[9, 11]

Of note, slightly fewer (n=37, 35.6%) reported to have long-term migration experiences. This could be because some of these trainees are second-generation migrants, whose parents moved to Ireland, and some may have retained only their parents' nationality. Given Ireland's heavy reliance on non-Irish trainees in its Psychiatry workforce, further research should be conducted to explore the factors impacting on career progression in psychiatry trainees in Ireland, both for Irish and non-Irish trainees.

Despite being amongst the highest paid trainees in Europe[9], a large majority of Ireland's psychiatry trainees had 'ever' considered leaving Ireland and more than half planned to work in another country. In terms of taking 'practical steps' towards migration, this article showed that there is a higher rate in Ireland (of almost half) compared to the European results (one-fourth). This might be an upshot of a previous positive short-term mobility experiences, as described in this study data from Portugal.[11]

Academic and work factors are consistent reasons for long-term migration for both all trainees in Ireland, and for those who were immigrants. In 2015, the CPsychI introduced streamline training. Trainees who successfully complete the Basic Specialist training (BST) with the CPsychI are automatically regarded eligible for Higher Specialist training (HST).[12] However, there have been cases where trainees who emigrated abroad following BST failed to secure a place on the HST scheme upon returning back to Ireland. This could potentially result in brain drain and impact on the Irish Psychiatry workforce.

The European Union (EU) directives states, for a national training programme to be recognised across Europe, it needs to fulfil the minimum requirement of four years of training in psychiatry.[13] Yet, psychiatry training in Ireland takes at least seven years, the longest in Europe, to complete.[13,14]

However, this does not seem to be a hindrance factor for non-native psychiatry trainees, placing Ireland as part of their long-term migration. The current postgraduate training programme in Psychiatry provides trainees sufficient clinical experience, and it is structured with weekly supervision, protected education and research time. The trainees are also afforded autonomy in terms of choosing their training placements based on ranking system prior to starting training. This in turn provides stability in terms of planning when taking personal factors such as family-time and schooling for children into consideration for many trainees. For non-native trainees, the special immigration pathway for doctors have made Ireland a more attractive destination in seeking postgraduate training.

The potential concern regarding retention would be once psychiatry trainees complete training. Ireland should capitalise on factors that attract both EU and non-EU doctors in building its retention strategy. Historically, despite economic downturn in the early 2000s, Ireland was considered an attractive country to migrate to for doctors and other healthcare professionals. This could be further capitalised as being the only English-speaking country within the EU following Brexit.

Our study highlights that academic and work opportunities, work life balance, equality and professional parity of esteem impact on migratory trends amongst Ireland's psychiatry trainees. Future considerations in strengthening recruitment and retention of Ireland's psychiatry workforce would require further research focussing on these factors.

As this dataset was collected in a pre-Brexit period, a repeat of this survey would be helpful to look at how the considerable changes in training in Ireland, the impact of Brexit and the Covid-19 pandemic would have on psychiatric trainees' views on mobility and migration.

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Surgical Same Day Admissions and Patient Satisfaction

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Abstract

Background

With the advent of outpatient preoperative assessment services, it has been possible to admit patients on the day of their operation, allowing for greater comfort for the patient and a more efficient usage of healthcare resources. We plan to evaluate patients' views, experiences and satisfaction on this process.

Methods

We have conducted a service evaluation of surgical same day admissions (SDA) at a large teaching hospital in the northwest of England to assess the patient satisfaction with the SDA process.

Results

We have approached 96 patients (56 females and 40 males) who were waiting for major elective surgery to complete a questionnaire about their views, experiences, expectation and satisfaction with the SDA process. 94 patients (98%) did not express any concerns about the SDA process, with an overall mean satisfaction score for the SDA process was 9.25 (range 2-10).

Conclusion

A comprehensive preoperative assessment service has contributed to high level of patient satisfaction in SDA process and found to be the patient preferred option for their surgical journey.

Keywords: pre-operative assessment, patient satisfaction, same day admissions.

Introduction

Over 10 million operations are performed each year in the NHS in England with an overall expenditure of £4.5 billon (over 4% of the total NHS budget).[1] Between 1987/88 and 2019/20, the total number of NHS hospital beds fell by 53 per cent – from 299,4000 to 141,000.[2] This highlighted a critical need to deliver care in both cost and time effective ways with efficient bed management and hospital flow.

Historically, patients were admitted to surgical wards several days prior to an operation for their assessment and anaesthetic evaluation. As a result, a number of patients were cancelled after a long wait wasting further resources. The NHS Modernisation Agency's Operating Theatre & Pre-operative Assessment Programme report in 2003, and establishment of the Preoperative Association in 2004, led to the wide spread development of preoperative assessment services in the UK.[3] Multidisciplinary preoperative assessment services with nurse led clinics, overseen by an anaesthetist, are widespread and have reduced the burden of assessment on clinicians on the day of surgery.[4] The establishment of preoperative assessment services has led to the development of surgical same day admissions (SDA) in the UK.

Current practice in the UK in most centres is for elective surgical patients to undergo outpatient preoperative assessment. Almost all patients are admitted on the day of surgery to a dedicated elective surgical admissions ward or unit, where they can be prepared for surgery. Patients then undergo their procedure and move to a recovery area. At this stage they are streamed into those undergoing day surgery, who return to the day-case unit to await discharge, and those who are discharged from recovery to an appropriate ward environment to remain as inpatients. This system means that ward beds only fill with their day 0 surgical patients later in the day, allowing for that bed to contain a discharging patient in the morning. This has a positive effect on both bed occupancy and patient flow.

The Liverpool University Hospital City Site, which encompasses the Royal Liverpool and Broadgreen Hospitals, started same day surgical admissions in 2006 with continuous refinement of admission criteria and processes. In view of paucity of literature on patient satisfaction with same day surgical admissions, we have conducted a qualitative service evaluation to understand patients' needs, views, expectations and satisfaction on the same day surgical admission process.

Methods

At a large University Teaching hospital in the Northwest of England we conducted a service evaluation of SDA between January 2018 to March 2018 in all patients undergoing major elective surgical procedure. This service evaluation was approved by the hospital audit department, and no ethical approval was sought due to the non-interventional nature of the work. After admission to the surgical admissions unit or admissions lounge, verbal consent was obtained to take part in the evaluation.

Patients were then asked to complete a short questionnaire about their views, experiences and expectations with SDA for their surgical procedure, and to also quantify their satisfaction with the whole process. We also asked whether they had received clear preoperative information, such as fasting instructions, when to stop drinking clear fluids, medication instructions (i.e., which medications to take on the day of the operation and which to stop) and the overall satisfaction with admissions process.

Results

96 patients (56 females and 40 males) were identified as having major elective surgery and were recruited to the service evaluation (table 1). To assess the patients' thoughts behind the usefulness of the preoperative assessment team and the information they provided, a visual analogue scale (VAS) was employed, where 0 was useless, and 10 was very useful. Our patients found that the information provided during the preoperative assessment was very useful, with a mean of 9.43 (median 10, range 4 – 10). All 96 patients mentioned that they had received clear instructions about when to stop eating solid food and when to stop drinking clear water. Only three patients reported that they had not received any instructions about their medications, and this was their reasoning for giving scores of 4, 6, and 7 respectively.

Specialty	Number of patients
General Surgery	39
Orthopaedics	32
Urology	12
Vascular Surgery	11
Ear, Nose & Throat	2
Total	96

Table 1: *Showing number of patients from each surgical speciality.*

General surgery includes colorectal, breast surgery, pancreatic surgery.

Out of the 96 patients who participated in this service evaluation, 94 patients (98%) expressed no concerns about the SDA process. The two patients who did express concern were worried about getting to the hospital for 7.30 AM, and worried about the operation in general.

The overall satisfaction score for the SDA process, where 0 = not happy at all and 10 = extremely happy, was a mean of 9.25 (median 10, range of 2 -10). One of the patients had waited for 3 hours in the waiting area prior to being admitted into the surgical admissions lounge and gave a satisfaction score of 2. Table 2 summarises the comments given by the patients about SDA.

Better to come on the day, otherwise I would have been more nervous thinking about it.
Less anxious, as I have received clear Preoperative information.
Staff were very helpful and kept me informed.
Very useful Preoperative information about my medications, fasting time and especially clear water before 6am.
No waiting around, less disruption to my work.
Very Anxious - Same day admission is better; admission previous day would have made anxiety worse.
Staff kept me informed.
Staff were all very nice and reassuring.
May be beds would be better as the patients can relax more before being called to theatre, if you have to wait a long time.

Table 2: *Free text comments about SDA.*

Discussion

Same day admission (SDA) for surgical intervention is a premise which has gained near universal acceptance in UK secondary care. Between 2011 and 2016 total national bed state reduced by around 8500, or 7%, but bed occupancy has increased by 10%.[5] Therefore, at a time where efficiency and cost savings are of paramount importance, techniques by which length of stay can be shortened, and morbidity after surgery reduced, are of increasing significance.

Role of preoperative assessment services

The development of multidisciplinary preoperative assessment services that can identify, investigate and appropriately manage comorbid conditions has been at the heart of developing same day admission systems.[4,6] This has developed alongside the publication of a plethora of evidence by NICE and the Royal College of Anaesthetist's Guidelines for the Provision of Anaesthetic Services (GPAS).[7,8] The development of preoperative assessment (POA) services and the ability to complete wide-ranging investigations in outpatients has drastically reduced the need for preoperative admission. The role of POA is six-fold: 1. To ensure the patients' health is good enough to safely undergo the operation and the anaesthetic, 2. To complete any additional investigations, 3. To begin the process of preoperative optimisation (if necessary), 4. To plan for the admission and deliver preoperative instructions regarding medications, fasting etc., 5. To educate the patient and begin the process of their investment in their care (health education), 6. Early identification of social care needs and arranging them for smooth discharge planning.

Same day admission is widely considered to be an integral part of the Enhanced Recovery After Surgery (ERAS) programme. ERAS encompasses a vast number of surgical, anaesthetic and logistical interventions that are designed to minimise surgical complications, shorten hospital stay, improve patient experience, decrease hospital acquired infections, and provide cost savings to the healthcare provider.[9,10] Individual centres and specific surgical procedures all now adopt their own modified systems, each tailored to suit their individual circumstances.

According to our data, preoperative assessment and information played an important role in the success of SDA by alleviating patient anxieties. Similarly in elective head and neck surgery patients, Kulasegarah et al (2008) have concluded the same.[11] In another study, Concannon et al (2013) concluded that successful preoperative assessment for general surgical patients helped to produce cost savings and improved patient satisfaction in SDA process.[12] In an economic analysis by Boothe and Finegan on changing the admission process for elective surgical patients, they concluded that a same day admission process reduces cost and enhanced hospital productivity without compromising patient safety.[13] Silvay et al developed effective outpatient preoperative evaluation for elective cardiac surgery patients and implemented same day admission over the past 8 years with significant improvement in outcomes, patient satisfaction and costs.[14]

Some concerns

Bowel Preparation before colorectal surgery is minimised in most modern Enhanced Recovery After Surgery (ERAS) programmes to avoid fluid shifts and potential intravascular depletion preoperatively. The exception to this is low anterior resection with ileostomy, which requires comprehensive bowel preparation to safely undertake the procedure. Other left sided colonic resections get a package of 2 enemas in most centres, with right sided resections receiving bowel preparation at the surgeon's discretion.[15,16] An Australian study by Lincoln et al could not demonstrate any adverse outcome by SDA for patients having a resection of colorectal cancer.[17]

Traditionally, management of complex anticoagulant needs has been an indication for admission to secondary care perioperatively. With the establishment of an outpatient anticoagulation service, we were able to address this issue with good outcomes and high satisfaction for our patients.[18]

Patient Satisfaction

A surgical admission can be a once in a lifetime experience for a patient, and so services need to develop strategies that help patients feel comfortable and reassured. Patient satisfaction is a complex measure of quality of care which does not relate solely to the technical success of a procedure but also with the quality of the pre- and post-operative care given.[19,20] It is evident, therefore, that improving the hospital experience is vital for good outcomes in both the short and long term. Late operation cancellations, poor communication between the patient and their team and an inability to meet the patient's expectations can all contribute to poor patient satisfaction.

Efficiency also plays a key role in patient satisfaction. Improving the throughput of the system without compromising patient safety not only improves patient satisfaction but also allows for more patients to be treated. Brown et al employed Lean Six Sigma methodology to implement and improve SDA in elective thoracic surgery patients. By eliminating wasteful activities to improve efficiency through a data-driven process they were able to increase the day of surgery admissions to more than 75% without any increased patient anxiety or stress.[21]

In this service evaluation, 94 of 96 patients were satisfied with our SDA process. A review of literature has shown the importance of preoperative patient education and information in improving patient satisfaction. Our patients also appreciated the detailed personalised preoperative information they received during their assessment, which could also have contributed to their satisfaction. The interaction between the patient and their healthcare team in the preoperative phase is key to ensuring that patients feel comfortable and informed about their care. Preoperative patient education delivered by anaesthetists, surgeons and nurses in the form of pamphlets, videos and conversations may improve patient outcomes, reduce length of stay, alleviate anxieties, and most importantly improve patient satisfaction. [22.23]

'Same day admission should never be a synonym for inadequate assessment and preparation'.[24] This tenet should always be adhered to whilst planning and delivering a safe service that includes routine same day admission. There are, however, significant cost savings to be made by implementing a comprehensive preoperative assessment service that facilitates this. This is allied to improvements in patient satisfaction, and ultimately outcomes.

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Declaration of Conflicts of Interest:
The authors have no potential conflicts of interest to declare.

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Prevalence of Sleep Disordered Breathing in an Ambulatory Bariatric Population

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Abstract

Aims

Rising global obesity trends suggest that the prevalence of sleep disordered breathing is under-represented. We aim to characterise the prevalence obstructive sleep apnoea (OSA) and obesity hypoventilation syndrome (OHS) in a population with ambulatory severe obesity (body mass index (BMI) ≥35 kg/m2).

Methods

Patients were recruited for this cross-sectional study between October 2017 and October 2018 from a weight management service for respiratory and sleep assessment.

Results

81 patients underwent full assessment. The mean age was 47 years and mean BMI was 53 kg/m2. OSA was prevalent in 92.6% (n=75), moderate-to-severe OSA in 70.4% (n=57) and OHS in 17.2% (n=14) of the total population. The risk of moderate to severe OSA increased significantly above a BMI of 50 kg/m2. The risk of daytime hypoventilation increased significantly above a BMI of 60 kg/m2. There was no significant difference in daytime sleepiness across obesity severity. Obesity and sleep disorder severity were significantly correlated, especially for females.

Conclusions

OSA is the most common obesity-related co-morbidity in a population with severe obesity. Patients with BMI ≥60 kg/m2 are at particular risk of OHS. The presence of a BMI ≥50 kg/m2 alone should indicate referral for sleep assessment.

Abbreviations

AASM	American Academy of Sleep Medicine	NIV	Non-invasive ventilation
ABG	Arterial blood gas	ODI	Oxygen desaturation index
AHI	Apnoea-hypopnoea index	OHS	Obesity hypoventilation syndrome
ANOVA	Analysis of variance	OSA	Obstructive sleep apnoea
BMI	Body mass index	OSAS	Obstructive sleep apnoea syndrome
CPAP	Continuous positive airway pressure	PaCO2	Arterial carbon dioxide tension
ESS	Epworth sleepiness scale	PAP	Positive airway pressure
HCO3	Bicarbonate	SpO2	Oxyhaemoglobin saturations
HSAT	Home sleep apnoea test	T<90	Time spent below oxygen saturations of 90%
IQR	Interquartile range	WMS	Weight management service

Introduction

The presence of severe obesity (BMI ≥40 kg/m^2) is rising globally, with obesity-related disease projected to increase in all European countries by 2030[1]. In Ireland, about 25% of males and females classify as having obesity (BMI ≥30 kg/m^2)[2], and if current obesity trends continue, it is estimated that by 2030, this will increase to 48% of men and 57% of women[3].

Obesity's effects on the respiratory system include obstructive sleep apnoea (OSA) and obesity hypoventilation syndrome (OHS)[4,5]. Obesity and sleep-disordered breathing have a synergistic metabolic effect on the body and are associated with hypertension and glucose intolerance[6,7]. OHS is associated with a higher risk of cardiopulmonary morbidity and mortality[5], although outcomes can be mitigated with the use of nocturnal positive airway pressure (PAP) therapy[8].

Sleep disordered breathing prevalence is increasing along with obesity trends, with the Swiss Hypnolaus study finding moderate-to-severe OSA in up to 50% of the general population[9]. Within a population with obesity, OSA prevalence increases up to 87%[10] and OHS prevalence is up to 20%[5]. However, data regarding disease trends in so-called 'super' (BMI ≥50 kg/m^2) and 'super-super' (BMI ≥60 kg/m^2) obesity is lacking as this group remains under-represented in current literature, notable because evidence suggests a dose-response relationship[11].

We aimed to assess up-to-date sleep disordered breathing prevalence in an ambulatory cohort with severe obesity in the context of rising obesity trends.

Methods

This was a prospective, cross-sectional study of adult patients with a BMI ≥40 kg/m2, or a BMI ≥35 kg/m2 with one or more obesity-related co-morbidities, attending an ambulatory weight management service (WMS), St. Columcille's Hospital, Dublin, Ireland. The St. Vincent's University Hospital Ethics and Medical Research Committee approved this study (e-Appendix 1). Exclusion criteria included an antecedent diagnosis of sleep disordered breathing.

Baseline information included demographics, anthropometrics including BMI and neck circumference and medical co-morbidities. Waist circumference was not measured due to limited measurement reliability and predictive power of disease in subjects with severe obesity[12].

Subjects were referred for a single-night level 3 cardiorespiratory home sleep apnoea test (HSAT)[13] using the Embletta Portable Diagnostic Study (Embletta PDS, Resmed PEI, Dublin, Ireland). Data was analysed in accordance with AASM scoring guidelines[14]. Data collected included apnoea-hypopnoea index (AHI), oxygen desaturation index (ODI), nocturnal oxygen saturation (SpO2) nadir, and time spent below oxygen saturations of 90% (percent of study (T<90)). OSA was defined as an AHI ≥5 events per hour. Obstructive sleep apnoea syndrome (OSAS) was defined as AHI ≥5/hr with daytime somnolence. OHS was defined as (1) BMI ≥30 kg/m2 and (2) arterial hypercapnia ≥6 kPa without an alternative cause for hypoventilation.

Subjects attended respiratory assessment including an interview, physical examination and arterial blood gas (ABG) analysis. The Epworth Sleepiness Scale (ESS) was used to assess subjects' daytime sleepiness, with a score above 10 indicative of excessive daytime sleepiness[15]. Subjects were asked whether the HSAT study night reflected a subjectively typical night of sleep. ABG sampled the radial artery at the wrist directly into a heparinised blood gas syringe and analysed on either the ABL90 Flex (Radiometer Medical ApS, Denmark), or ABL800 Flex (Radiometer Medical ApS, Denmark) machines, regularly calibrated as per local hospital protocol.

The primary outcome was to characterise the prevalence of sleep disordered breathing in this population with severe obesity. Secondary outcomes included evaluating correlation between parameters of sleep disordered breathing and obesity severity.

Subjects were stratified by obesity severity into three subgroups: BMI of 35-50 kg/m2, 50-60 kg/m2, or ≥60 kg/m2. Results across groups were compared using analysis of variance (ANOVA) with post hoc Tukey analysis, Kruskal–Wallis with Dunn's multiple comparison, and Chi-squared tests for parametric, nonparametric, and categorical variables, respectively. Correlative statistics were performed using Spearman's or Pearson's correlation coefficients for continuous variables, according to distribution, or a Fisher's exact test for categorical variables.

Main-effects logistic regression was performed and reported as odds ratios to assess the dependent variables of OHS or moderate to severe OSA (AHI ≥15/hr) against predictors age, sex, hypertension, neck circumference, diuretic use, and BMI as a continuous variable (model 1), and categorically over 50 kg/m2 (model 2) and over 60 kg/m2 (model 3). AHI was included as an independent variable in the analysis for OHS.

All statistics were calculated using IBM SPSS version 24 (IBM Corporation, New York, USA) and Prism version 6 (GraphPad Software, San Diego, California, USA). P-values of ≤0.05 were considered statistically significant. Missing data was not included in the analysis.

Results

A total of 210 patients were screened. 85 patients were excluded due to an antecedent diagnosis of sleep disordered breathing and 44 patients refused to participate. Two patients did not attend for follow up. A total of 81 patients were included in the OSA analysis. Nine patients with missing ABG data were not included in the OHS analysis.

The baseline characteristics of the study population are displayed in Table 1. There was a two-thirds female predominance, the mean age was 47 years and the mean BMI was 53 kg/m2. Patients with a BMI 50-60 kg/m2 were found to be significantly younger than those with BMI <50 kg/m2 (p<0.001).

	Obesity Class (kg/m2)								
	<50 (n=27)		50-60 (n=36)		>60 (n=18)		Total (n=81)		p-value
Female (%)	16	(59.3)	25	(69.4)	13	(72.2)	54	(66.7)	0.594
Age, years	53	(11)	43	(10)	47	(8)	47	(11)	<0.001
Weight, kg	124.74	[21]	155.58	[19]	182.29	[32]	151.24	[31]	<0.001
BMI, kg/m2	45.2	[8.0]	53.3	[6.0]	64.0	[2.0]	53.0	[11.5]	<0.001
Neck circumference, cm	44.5	(5)	45.9	(5)	47.3	(5)	45.7	(5)	0.314
Hypertension (%)	16	(59.3)	13	(36.1)	10	(55.6)	39	(48.1)	0.148
T2DM (%)	11	(40.7)	9	(25.0)	5	(27.8)	25	(30.9)	0.388
Dyslipidaemia (%)	17	(63.0)	8	(22.2)	3	(16.7)	28	(34.6)	0.001
CRP, mg/L	5	[4]	10	[8]	10	[14]	8	[8]	0.031
HbA1c, mmol/mol	39.0	[14]	38.0	[10]	43.5	[9]	40.5	[12.5]	0.095
Diuretics (%)	5	(18.5)	3	(8.3)	2	(11.1)	10	(12.3)	0.470
COPD (%)	4	(14.8)	0	(0.0)	1	(5.6)	5	(6.2)	0.053
Asthma (%)	3	(11.1)	9	(25.0)	4	(22.2)	16	(19.8)	0.374
Smoking history (%)	14	(51.9)	19	(52.8)	5	(29.4)	38	(46.9)	0.526
Pack years	0.5	[45]	1.0	[16]	0	[33]	0.0	[12.5]	0.353

Table 1: *Baseline characteristics of bariatric population stratified by obesity severity.*

Data are presented as mean (standard deviation) or median [interquartile range], unless otherwise indicated. BMI = body mass index. T2DM = type 2 diabetes mellitus. CRP = c-reactive protein. HbA1c = glycosylated haemoglobin. COPD = chronic obstructive pulmonary disease.

OSA (AHI ≥5/hr) was seen in 75 subjects (92.6%; 95% CI 84.6 – 97.2), including 25 males and 50 females (92.6%; 95% CI 75.7 – 99.9 and 92.6%; 95% CI 82.1 – 97.9, respectively, p=0.999). Moderate to severe OSA (AHI ≥15/hr) was seen in 57 subjects (70.4%; 95% CI 59.2 – 80), including 22 males and 35 females (81.5%; 61.9 – 93.7 and 64.8%; 50.6 – 77.3, p=0.196). OHS was seen in 14 subjects (17.3%; 95% CI 9.8 – 27.3), including six males and eight females (22.2%; 95% CI 8.6 – 42.3 and 14.8%; 95% CI 6.6 – 27.1, p=0.534). The prevalence of moderate-to-severe OSA (AHI ≥15/hr) and OHS increased significantly with obesity severity (p=0.021 and p<0.001, respectively). There was no significant increase in OSAS prevalence across obesity severity groups (Figure 1).

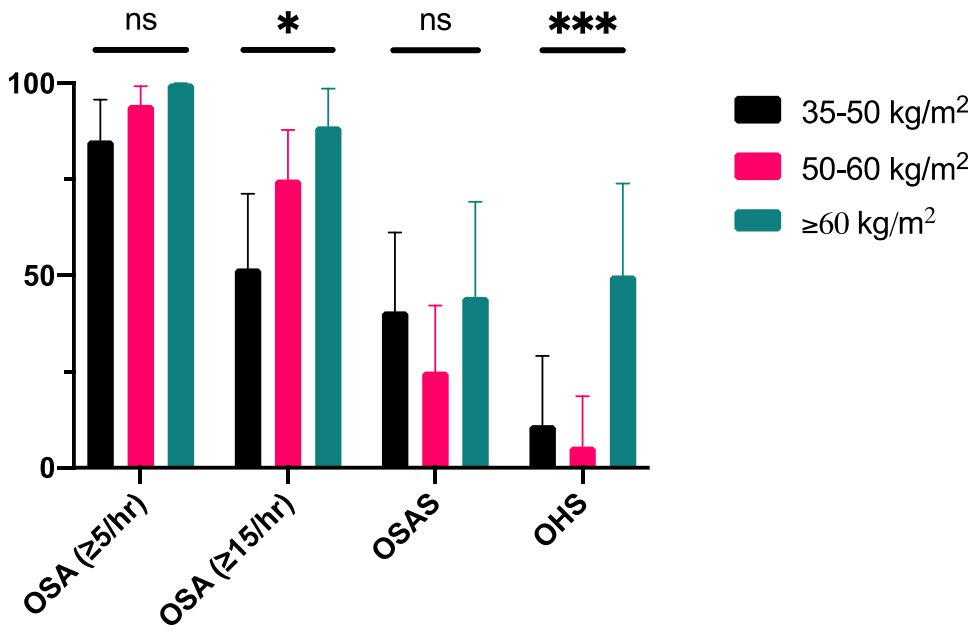

Figure 1: *Sleep disordered breathing prevalence stratified by obesity severity.*

OSA = obstructive sleep apnoea. OSAS = obstructive sleep apnoea syndrome. OHS = obesity hypoventilation syndrome.

Increasing obesity severity was significantly associated with OSA severity as measured by AHI, ODI and oxygen saturation nadir (Table 2). BMI also significantly correlated with markers of daytime hypoventilation in PaCO2 and HCO3 (Table 2).

AHI and BMI maintained a significant correlation in females but not males, despite a similar trend (Table 2). However, a significant correlation persisted in both sexes between BMI and both arterial carbon dioxide (PaCO2) and bicarbonate (HCO3) (Table 2).

		r	95% CI	p-value
AHI	Total	0.312	0.094 – 0.502	0.005
	Males	0.311	-0.091 – 0.625	0.115
	Females	0.340	0.072 – 0.563	0.012
4% ODI	Total	0.278	0.057 – 0.473	0.012
	Males	0.202	-0.204 – 0.549	0.312
	Females	0.336	0.067 – 0.560	0.013
Mean SpO2	Total	-0.116	-0.332 – 0.112	0.303
	Males	-0.115	-0.483 – 0.288	0.569
	Females	-0.167	-0.423 – 0.114	0.228
T<90 (%)	Total	0.133	-0.094 – 0.347	0.237
	Males	-0.037	-0.421 – 0.358	0.854
	Females	0.265	-0.014 – 0.506	0.055
Nadir SpO2	Total	-0.342	-0.526 – -0.127	0.002
	Males	-0.205	-0.551 – 0.201	0.305
	Females	-0.458	-0.651 – -0.209	<0.001
PaO2	Total	-0.108	-0.346 – 0.143	0.385
	Males	-0.034	-0.460 – 0.405	0.882
	Females	-0.169	-0.448 – 0.140	0.266
PaCO2	Total	0.356	0.135 – 0.543	0.002
	Males	0.416	0.012 – 0.703	0.039
	Females	0.340	0.059 – 0.572	0.019
HCO3	Total	0.400	0.186 – 0.578	<0.001
	Males	0.575	0.221 – 0.795	0.003
	Females	0.357	0.077 – 0.584	0.014

Table 2: *Correlation between BMI and parameters of sleep disordered breathing.*

AHI = apnoea-hypopnoea index. 4% ODI = oxygen desaturation index by 4%. SpO2 = oxygen saturations. T<90 (%) = time spent below oxygen saturations of 90% (% of the total recording time). PaO2 = arterial oxygen tension. PaCO2 = arterial carbon dioxide tension. HCO3 = arterial bicarbonate.

In a logistic regression model, BMI as a continuous variable was the significant predictor for moderate to severe OSA (OR 1.102, 95% CI 1.010 – 1.223, p=0.046) against non-significant predictors of age, sex, neck circumference, hypertension and diuretic use (Table 3). A BMI ≥50 kg/m2 increased the odds ratio of moderate to severe OSA (OR 6.804, 95% CI 1.754 – 31.240, p=0.008).

BMI was also a significant predictor for OHS (OR 1.144, 95% CI 1.057 – 1.269, p=0.003) along with age (OR 1.115, 95% CI 1.022 to 1.242, p=0.026) against non-significant predictors of sex, hypertension and AHI (Table 3). A BMI ≥60 kg/m2 significantly increased the odds ratio of OHS (OR 5.692, 95% CI 1.443 to 25.190, p=0.015).

(A) Moderate to severe OSA		Odds ratios	95% Confidence intervals	p-value
Model 1	**Age (years)**	1.003	0.941 to 1.068	0.930
	Male	2.467	0.367 to 18.500	0.355
	BMI	1.102	1.010 to 1.223	0.046
	Neck circumference	1.014	0.851 to 1.223	0.881
	Hypertension	1.304	0.344 to 5.149	0.696
	Diuretic use	3.862	0.456 to 89.520	0.278
Model 2	**Age (years)**	1.016	0.948 to 1.090	0.657
	Male	2.069	0.306 to 14.920	0.454
	BMI ≥50 kg/m2	6.804	1.754 to 31.240	0.008
	Neck circumference	1.024	0.860 to 1.242	0.792
	Hypertension	1.562	0.383 to 6.812	0.537
	Diuretic use	3.743	0.448 to 83.840	0.282
Model 3	**Age (years)**	0.986	0.926 to 1.046	0.632
	Male	1.827	0.283 to 12.670	0.525
	BMI ≥60 kg/m2	2.519	0.518 to 18.760	0.292
	Neck circumference	1.041	0.880 to 1.250	0.648
	Hypertension	1.080	0.293 to 4.021	0.907
	Diuretic use	4.305	0.558 to 93.450	0.224
(B) Obesity hypoventilation syndrome				
Model 1	**Age (years)**	1.115	1.022 to 1.242	0.026
	Male	1.507	0.320 to 7.277	0.599
	BMI	1.144	1.057 to 1.269	0.003
	Hypertension	0.805	0.127 to 3.963	0.788
	AHI	1.016	0.997 to 1.038	0.107
Model 2	**Age (years)**	1.082	1.005 to 1.182	0.052
	Male	1.223	0.320 to 4.513	0.763
	BMI ≥50 kg/m2	2.766	0.539 to 18.380	0.248
	Hypertension	1.250	0.316 to 5.117	0.750
	AHI	1.017	0.999 to 1.037	0.069
Model 3	**Age (years)**	1.072	0.996 to 1.167	0.079
	Male	0.871	0.207 to 3.381	0.844
	BMI ≥60 kg/m2	5.692	1.443 to 25.190	0.015
	Hypertension	1.172	0.271 to 5.200	0.830
	AHI	1.024	1.005 to 1.046	0.016

***Table 3**: **(A)** Multiple logistic regression to assess association of predictors of moderate to severe obstructive sleep apnoea (Model 1: Tjur's R2=0·134, adjusted R2=0·064; Model 2: Tjur's R2=0.186, adjusted R2=0.120; Model 3: Tjur's R2=0.085, adjusted R2=0.011). **(B)** Multiple logistic regression to assess association of predictors of obesity hypoventilation syndrome (Model 1: Tjur's R2=0.328, adjusted R2=0·277; Model 2: Tjur's R2=0.128, adjusted R2=0.062; Model 3: Tjur's R2=0.190, adjusted R2=0.129)*

Discussion

In our ambulatory bariatric cohort, we found a high prevalence of OSA (92.6%) and OHS (17.2%). Correlation between AHI and BMI was stronger and more significant for females rather than males, suggestive of possible physiological sex differences apart from BMI contributing to OSA severity in males. However, BMI remained the significant predictor for AHI against potential confounders of age, sex, neck circumference, hypertension, and diuretic use. The risk of moderate to severe OSA increased significantly above a BMI of 50 kg/m2. The risk of daytime hypoventilation increased significantly above a BMI of 60 kg/m2. We did not find an increase in reported OSAS despite increasing sleep disordered breathing prevalence.

Our methodology differed from existing literature by recruiting all-comers to a bariatric service, as opposed to recruitment from sleep clinics[11] or emergency departments[16,17]. We may have underestimated the prevalence of sleep disordered breathing in this population by not including patients with antecedent sleep diagnoses or those who refused to participate, although including these may have in fact over-estimated the burden of disease and not reflect an ambulatory population.

OSAS prevalence in our population was higher than the general population (33.3% versus up to 18%). The lack of a significant difference in OSAS prevalence across obesity severity raises questions regarding the utility of screening questionnaires in this population. The ESS is often used as a single tool by physicians to screen for daytime somnolence, but our data suggests that in a population with severe obesity, daytime symptoms do not change significantly even in the presence of more severe disease.

Our data suggests 'tipping points', whereby the risk of moderate-to-severe OSA significant rises with a BMI >50 kg/m^2, and the risk of OHS with a BMI ≥60 kg/m^2. This may be due to reduced functional lung volumes in severe obesity, as reported by Marillier, et al[18], worsening ventilation/perfusion mismatch or right to left shunting, reducing alveolar gas stores and prolonging nocturnal hypercapnia altering the daytime ventilatory response[19]. In addition, increased leptin resistance in severe obesity may blunt daytime ventilation[20].

In our study, obesity correlated more significantly with desaturation (SpO2 nadir) in females than males. Why females displayed more desaturation is unclear. Men tend to develop more severe OSA for a given level of obesity, likely due to differences in adiposity distribution[21]. Pre-menopausal oestrogen and progesterone levels in females reduce upper airway collapsibility, although this increases post-menopause[22] (the mean age for females in our cohort was 46 years). We did not measure waist circumference due to its limited measurement reliability and ability to predict disease in the context of severe obesity[12]. However, more detailed anthropometric measurement may help account for the sex differences seen here.

Our BMI groups were not matched for age; it is possible that patients who are younger with more severe obesity are more likely to seek help. Our regression analysis did not find age or sex to be significant predictors of OSA severity as compared to BMI; age predicted for OHS, which may reflect age-related leptin resistance[23].

Our study's main strength was the recruitment of unselected ambulatory patients with severe obesity who had not yet been diagnosed with sleep disordered breathing. Our study population demographics largely reflects published data from tier 3 weight management services. A systematic review of obesity services published in 2019 described a mean population BMI below that of our cohort (range 34.1 to 49.4 compared to 53 kg/m2) suggesting that obesity is continues to trend upwards in severity, as shown in our cohort[24]. However, recruiting from a weight management service may have introduced a self-selection bias of patients who are symptomatic and/or interesting in seeking medical care.

Performing limited sleep studies instead of polysomnography was a pragmatic choice that allowed for a high volume of patients to be screened in accordance with clinical guidelines[13]. However, without hypnogram monitoring, indices are calculated for total study time rather than total sleep time and may be underestimated. Nor did we control for co-morbid sleep complaints such as insomnia or sleep medication use, although commonly used 'z-drugs' do not affect OSA severity[25]. We also note that limited HSAT have not been specifically validated for use in the severely obese population in a published clinical trial.

We did not exclude patients with a smoking history or a diagnosis of COPD, although OHS diagnostic criteria requires excluding alternate causes for hypoventilation. As there was no significant difference in smoking history between obesity groups, we do not feel that our results were significantly affected in this regard, and our inclusive criteria are reflective of ambulatory service attendees.

Finally, we did not perform any pre- or post-menopausal subgroup analysis, and the Caucasian predominance of our study population also limits international generalisability of our results.

Our findings show that in subjects with severe obesity, OSA prevalence is higher than any other single metabolic co-morbidity, and the risk of significant sleep disordered breathing increases after thresholds of BMI ≥50 kg/m2 for moderate-to-severe OSA and ≥60 kg/m2 for OHS. The presence of so-called 'super' obesity alone (BMI ≥50 kg/m2) should trigger early sleep assessment to identify patients at risk of increased cardiopulmonary morbidity and mortality.

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Financial Resilience Among Doctors in Training and the COVID-19 Pandemic

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Abstract

Aim

Deaths of doctors during the COVID-19 pandemic prompted an assessment of financial resilience among doctors in training in Ireland

Methods

In 2020, a 27-item online survey of demographics, work practices and finances was circulated nationally. The results were assessed using multiple correspondence analysis to develop a financial resilience framework.

Results

161 responses were received. Only 26 (16.1%) respondents had income insurance, 10 (6.2%) had composed a will, and 41 (25.5%) had life insurance. 135 (83.9%) had not sought financial guidance and 153 (95%) were not aware of employer supports in event of death/disability. 105 (65.2%) would be considered financially fragile based on their median savings. Using a multiple correspondence analysis, 74 (46%) of the cohort were financially insecure. In the event of death 44/70 (62.9%) of those with dependents, felt that their dependents would not be looked after.

Conclusion

The majority of doctors in training lack both financial resilience and knowledge, nor are they aware of financial support structures. Financial management should be incorporated into medical education.

Introduction

In March 2020, rising cases of Coronavirus 2019 (COVID-19) led to a government mandated lockdown and an escalation of healthcare resources. Reports from countries already affected by the virus had documented a high occupational infection risk and mortality among healthcare workers [1,2,3]. The onset of lockdown was associated with much uncertainty regarding the outcomes and impacts of the illness [4,5,6] ; and prompted a review of financial resilience among doctors in training in Ireland.

Financial resilience refers to a household's capacity to absorb, respond, and adjust to a financial shock. It is a dynamic concept characterized by adaptability – the capacity to recover from the disturbance while also taking advantage of the benefits offered by the shock [7,8]. A household may be described as financially resilient when it exhibits "*the ability to access and draw on internal capabilities and appropriate, acceptable and accessible external resources and supports in times of financial adversity"* [8]. Research examining the financial resilience of the household typically assesses income, savings, the ability to meet living expenses, the capacity to raise funds to cover unexpected expenses, and debt, against various household characteristics, such as household composition, tenure, employment status [9.10].

The objective of this analysis was to examine the financial resilience of medical doctors at the frontline of the COVID-19 pandemic when occupation related death or disability was a potential reality. Our analysis considered the doctor's household as the unit of analysis, and illness or death due to COVID-19 as the disruption to income.

Methods

A 27-item online survey was devised to assess financial resilience and life planning among doctors in training. Ten questions were binary while the remaining questions were multiple choice (Table 1). Questions were grouped in three sections; the first 7 related to the demographic characteristics of the doctors the following 8 considered the impact of the pandemic on work practices, and the final 12 examined the financial security of the doctors and their immediate families. All responses were treated as categorical variables. The survey was circulated via hospital-based email systems to 1,000 doctors in training in the Republic of Ireland, between May and June 2020. A total of 161 replies were received.

Table 2: *Questionnaire Assessments.*

#	Variable	Question
1	*Age*	What is your age?
2	*gender*	What is your gender?
3	*county*	What county do you work in?
4	*grade*	What is your grade?
5	*irish*	Are you an Irish National?
6	*nationality*	If not, what is your nationality?
7	*income*	What is your yearly income?
8	*redeployed*	Have you been redeployed due to the COVID-19 outbreak?
9	*covid_contact*	If yes, has the redeployment included care of COVID-19 patients?
10	*Ppe*	Do you feel that you have all the necessary tools (PPE) to perform your task without the risk of becoming infected with COVID-19?
11	*worry*	How worried are you about contracting COVID-19?
12	*tested*	Have you been tested for COVID-19 or placed in isolation?
13	*rights*	Do you know your employment rights during this COVID-19 emergency?
14	*voiced*	Have you voiced your health and safety concern to your employer or line manager?
15	*response*	If yes; do you feel the appropriate response or action has been taken by your employer to accommodate your concerns?
16	*dependants*	Do you have dependents? A dependent is a person who relies on another, especially a family member, for financial support.
17	*dependents_home*	If yes, are your dependents living in:
18	*sole*	Are you your household's sole earner?
19	*inc_ins*	Do you have income insurance? Income insurance, or income protection, provides you with a replacement income if you cannot work as a result of an illness or injury for a certain period of time.
20	*savings*	Should you lose income, how long will your savings last?
21	*support*	Should you run into financial trouble; would you receive financial support from family or friends?
22	*Hse*	Do you know if there are any workplace policies through the HSE to ensure sufficient support to you and/or your families?
23	*debt*	Do you have a mortgage or any significant debt to pay?
24	*advice*	Have you sought advice on mortgage or life assurance during this pandemic?
25	*life_ins*	Do you have life insurance? Life insurance is a form of insurance in which a person makes regular payments to an insurance company, in return for a sum of money to be paid to them after a period of time, or to their family if they die.
26	*Will*	Have you composed a legally binding will?
27	*dep_ok*	Do you think your dependents will be financially looked after if you pass away?
28	*Resilience*	$resilience = sole + savings + support + income$

Data exploration was conducted using multiple correspondence analysis (MCA)[11]. Variables that were both spatially related, in the analysis output, and theoretically related, based on suppositions about the characteristics of financial resilience, were aggregated to form a composite variable.

Multiple correspondence analysis was then used to explore the data to describe latent unobservable variable(s) through the analysis of observable categorical [12,13]. Guided by the literature [14,15], 11 variables were analysed **(Table 2).**

Table 2: *Variables included in the Multiple Correspondence Analysis.*

Variable	Description
income	Level of income (4-point scale)
savings	Level of savings (4-point scale
support	Presence of family support (2-point scale)
sole	Status as household sole earner (2-point scale)
rights	Awareness of employment rights (2-point scale)
hse	Awareness of HSE employment support schemes (2-point scale)
will	Presence of legally binding will (2-point scale)
advice	Has the respondent recently taken financial advice (2-point scale)
debt	Presence of mortgage or personal debt (2-point scale)
inc_ins	Presence of income insurance cover (2-point scale)
life_ins	Presence of life insurance cover (2-point scale)

The dimensions suggested by the analysis reveal a demarcation along the lines of what might be termed financial wherewithal (level of *income* and *savings*, status as household *sole* earner and the presence of *support* from home) and financial safety (the presence of *debt*, income insurance (*inc_ins*) and life insurance (*life_ins*)). Informed by the results of the MCA, these four variables were chosen to form a composite measure of resilience. Debt, life insurance and income insurance were not included in the composite as they capture homeownership. Statistical analysis was performed in R Studio.

Results

Of the 161 doctors that participated in the survey, responses were evenly distributed by gender (47.2% female). The majority of respondents were over 30 years old (69.6%) and based in Cork (77%). Over 60% were Registrars, 34% were Senior House Officers (SHO) and 4% were Interns; 65% were Irish. Of the non-Irish doctors, 81.5% were non-European Union (EU) citizens.

The median salary for this cohort was inferred to be €55,000, the center of the median class. Over half the respondents were the household's sole earner. Less than half had dependents (43.5%), of which 14.9% had dependents who did not reside in the EU. Just under 30% of respondents estimated that their savings would last for less than 3 months if they had no income, while 34% had between 3- and 6-months income accumulated, 24% had between 6 and 12 months, and 12.6% had more than one year of savings put aside.

40% of doctors in this sample had loans or mortgages, with Irish doctors representing nearly 75% of those with debt. However, the statistical relationship between nationality and the incidence of debt is weak ($\chi_1^2 = 3.02, p\ val = 0.082$).

16.1% of the recipients of the survey had income insurance. Life insurance cover rates were 25.5%, and only 6.2% had composed a legally binding will. The majority (83.9%) of the doctors surveyed had not sought any financial guidance at the time of the survey and 95% of respondents were not aware of any employer programs to support their families.

Most of the respondents (83.1%) were unaware of their employment rights during the pandemic. 59% of respondents were either not worried or somewhat worried about contracting COVID-19, while just 12% were very worried. There is a moderate relationship between worry and nationality, with foreign doctors being more worried about the disease than Irish ($\chi_3^2 = 7.63, p\ val = 0.054$).

Based on the results of the MCA, a composite score (*resilience*) was calculated from the variables which encapsulate financial wherewithal – sole, savings, support and income. Variables were coded so that increasing values represented an increase in financial resilience. The composite was a simple unweighted summation of the value of each variable category resulting in a measure with a score range of 3 to 10 **(Table 3).** This assumes each component of the composite is equally important, which is unlikely, but in the absence of evidence as to the impact of each component on resilience it seems a reasonable approach.

It would be tempting to classify the scores as “Poor”, “Moderate”, “Excellent”, and so on, but without comparisons in the literature, such classification would be arbitrary. As there are 8 discrete scores, they are divided for convenience into 4 classes denoting increasing resilience, A through D, with A being the lowest class and D the highest **(Table 3)**. Registrars aged 30 – 35 are the most common grade in each class. Class A and C are evenly split between the genders, while Class B is split 40/60 female to male; this ratio is reversed for those in Class D. Class A and B are evenly split between foreign and Irish doctors, however 77.4% of those in Class C are Irish, increasing to 90.5% in Class D.

Table 3: *Frequency of Resilience Estimates among Doctors in Training.*

Class	Score	Count	Proportion	Cumulative	Class Proportion
A	3	9	6%	6%	14%
	4	13	8%	14%	
B	5	31	19%	33%	40%
	6	34	21%	54%	
C	7	33	20%	75%	33%
	8	20	12%	87%	
D	9	14	9%	96%	13%
	10	7	4%	100%	

** all figures rounded to nearest percent*

Only 19% of doctors in the highest class have binding wills, with a negligible number in the other classes (<6%). Equal numbers of Class A and B doctors have dependents but in the higher classes, the proportion with dependents first falls to 35.8% and then to 14.3%. Class A and B doctors tend to be sole earners (86.4% and 66.2%), while the reverse is true for Class C and D (35.8% and 23.8%). In terms of debt, about 40% of doctors have debt with the number slightly higher for Class C.

Discussion

This study examines the financial resilience of doctors in training at a time when occupation related death and illness was a potential reality. While previous studies of this group have focused on mental resilience [16,17], our findings indicate significant anxiety regarding financial resilience in the weeks following the COVID related lockdown.

McKnight & Rucci [10] identify an accumulation of savings to the value of 3 times monthly income as the minimum threshold required, irrespective of welfare provision, so as not to be considered financially insecure. They define households with net financial assets to the value of at least six months of household income as financially secure. Based on this criterion, over 64% of doctors within this study would be considered financially fragile.

We can make some rough comparisons for this survey using the HSE salary scales and assumptions around household allowances and reliefs. Based on class midpoints, we calculated the median value of savings for interns as €3,731, representing 1.5 months of savings. According to McKnight & Rucci [10], this cohort of doctors are financially insecure.

In 2018 national median savings and gross salaries in the Household Finance and Consumption Survey (HFCS) were €5,000 and €47,900 respectively [18], which are higher than that of an intern. SHOs and registrars had median savings of €14,009 and €16,657 respectively, both falling below the 6 months of savings required to be considered financially secure. These figures are reflected in the wider community in a survey conducted by Kempson and Poppe [9] who noted that the "resilience for the future" component was the worst performing measure of that paper's financial well-being composite.

By comparison with national figures reported in the HFCS, 38.3% of households where the highest education of the reference person was a third level or post-graduate degree had a mortgage with a median outstanding balance of €155,400 and 32% had a non-mortgage loan (€8,200)[19]. These figures are broadly in line with our sample for which 60% reported the presence of mortgage or personal debt. Life insurance is a requirement for a mortgage in Ireland, and 25.5% of respondents registered this insurance, which we assume indicates the presence of a mortgage. Of concern is the low levels of doctors who have income insurance (16.1%). While most of this cohort were HSE employees, benefits are based on total average earnings, providing little in the way of early retirement support on medical grounds, or death for the household.

At the beginning of March 2020, a week after the first case of Covid-19 was confirmed in Ireland, the government advised of the COVID-19 'special leave with pay' arrangements [20]. However, most of the doctors surveyed were not aware of any occupational support programs. Almost two-thirds (62.9%) did not think that their dependents would be looked after if they died; over twice as many foreign doctors felt this way as Irish doctors. Most respondents had not sought any financial guidance. These findings imply low levels of financial knowledge and social capital, and consequently resilience[8].

Low sample size was a persistent issue during statistical analysis, while a large number of surveys were sent out the overall response rate was modest (16.1%), and predominantly from this area. The low response rate may be due to the increased workload belabouring medical staff, and also a certain amount of 'survey fatigue'. The majority of respondents were at the latter stages of training reflecting the importance of this issue as responsibilities such as debt and dependants increase with age. It is an avenue for future research to refine and repeat the analysis presented in this paper on a larger sample size with greater statistical power.

Financial resilience is a dynamic concept, this study was limited to measuring the financial resilience of this cohort at a single point in time. Nonetheless, the study indicates a low level of financial preparedness among doctors in training with the majority of doctors falling under the threshold to be considered financially secure, failing to be aware of available supports, and concerned about their dependents. Courses on financial resilience should be integrated into training programs similar to existing courses on emotional resilience and well being, by our training bodies.

Declaration of Conflicts of Interest:
The authors have no conflicts of interest to declare.

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A Foodborne Outbreak of Cryptosporidiosis Likely Linked to Salad Leaves

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Abstract

Aims

We describe an outbreak of cryptosporidiosis and the outbreak control team response.

Methods

An outbreak control team was convened to investigate a cluster of cryptosporidiosis cases notified from a single South Dublin laboratory in July 2020. All cases were interviewed, and Environmental Health Officers conducted 110 food premises inspections to collect food and water samples.

Results

Forty cases were linked to the outbreak, of which 33 fulfilled the confirmed case definition. Thirty-one (78%) of cases were aged 20 to 40 years old. Fourteen (35%) cases required hospitalisation. Several cases shared a common restaurant history. Cross-referencing of food exposures identified a common salad box served in the implicated restaurants, sourced from a single farm, which lead to a precautionary product recall. Sample genotyping of 13 isolates identified *C. parvum*, gp60 subtype IIaA18G3R1 as the outbreak strain. Testing of water and salad leaf samples failed to detect *Cryptosporidium* oocysts.

Conclusion

This investigation highlights the surveillance value of routine PCR screening of stool samples for *Cryptosporidium*, which facilitated early detection of this outbreak. However routine surveillance remains inconsistent at Irish and European level. To accurately measure the incidence of *Cryptosporidium* infection in Europe, a comprehensive, uniform surveillance system is needed.

Keywords: Surveillance, cryptosporidiosis, Cryptosporidium, Ireland, foodborne, outbreak, food safety, salad

Introduction

Cryptosporidium is a protozoal parasite which causes the diarrhoeal disease cryptosporidiosis. *Cryptosporidium* species can be found in water, soil, food or any surface which has been contaminated with human or animal faeces.

Primary transmission occurs via the faeco-oral route from either animals or humans. Secondary, person to person, transmission can also be a feature of outbreaks particularly in the case of food handlers or caregivers. *Cryptosporidium* oocysts have the potential to cause large outbreaks as they are highly resistant to chlorine based disinfectant and can survive many months in the environment [1, 2]. Contamination of public water supplies [3, 4] and fresh produce [5-9] have been implicated in a number of large European outbreaks of cryptosporidiosis.

Clinical presentations of infection can range from mild GI upset to severe diarrhoea necessitating hospital admission. The incubation period is usually 5 – 7 days although wider ranges have been reported [10, 11]. There is no specific therapy licensed in the EU and treatment is limited to supportive care.

Cryptosporidiosis is a notifiable disease in Ireland. Previous reported outbreaks have been related to contaminated water supplies[12]. High yearly rainfall and open reservoirs likely contribute to the vulnerability of Irish water system to contamination [13]. In 2019, a total of 91 cases of cryptosporidiosis were notified to the Public Health Department of the Greater Dublin area; a background notification rate in the order of zero to five cases per week. Since 2012 Ireland has consistently reported the highest annual rate of cryptosporidiosis in the European Union (EU)[14].

Methods

On the 28th July 2020, a cluster of nine cases of *Cryptosporidium* were notified to the local Public Health Department by a single laboratory in the South Dublin/Wicklow area. An outbreak was declared and an outbreak control team (OCT) convened the same day. All notified cases were contacted by phone to discuss enteric precautions and complete a standardised exposure questionnaire. Questionnaires focused on potential high-risk exposures, such as salad leaves, unpasteurised dairy, private water supply or contact with animals. Information was collated using Microsoft Excel and analysis was performed using SAS (University version).

A likely foodborne source was suspected from the preliminary outbreak investigation, based on the frequency of reported restaurant exposures, and an initial cluster of six cases involving a single restaurant. The following case definitions were then used by the OCT to classify cases in the outbreak:

Confirmed: laboratory confirmed cryptosporidiosis with onset of gastrointestinal symptoms from July 16th, 2020 onwards, who ate in a common food premises in the 14 days prior to symptom onset.

Possible: laboratory confirmed cryptosporidiosis with onset of gastrointestinal symptoms from July 16th, 2020 onwards, who ate in any food premises in the Dublin/Wicklow area in the 14 days prior to symptom onset.

Sporadic: laboratory cases of cryptosporidiosis notified from July 16th onwards without any history of having eaten in a food premises in the Dublin/Wicklow area in the 14 days prior to symptom onset.

Environmental Health Officers began inspections of food businesses in which suspected cases had consumed food in the 14 days preceding the onset of their symptoms. In total, 110 inspections of food businesses and suppliers were carried out.

An extensive cross-check of restaurants, suppliers and salad products was undertaken. One particular product, a seasonal salad box, was identified as having been supplied to all premises associated with these 31 cases. Two further cases (household contacts) were epidemiologically linked to the outbreak. The salad box was produced by Farm A and shipped exclusively by two suppliers. Five 25g samples of salad leaves were collected from these suppliers on 29th, 30th July and 4th August 2020 and tested for presence of cryptosporidium oocysts by Eurofins Biomnis Laboratory. The customer lists of the suppliers were then obtained to identify other premises to which the product had been distributed.

Farm A primarily produced baby leaf salad but was a mixed enterprise with livestock in adjoining fields. There was a private well onsite at the farm; from which a 10 litre water sample was analysed for *E. coli*, *Enterococci* and *Cryptosporidium*. The OCT was informed that the well water was not used for washing of the salad leaves but rather for use in steam cleaning of the sorting bench and product containers and crates after production.

Cases were laboratory confirmed as detection of *Cryptosporidium* species by real time PCR testing using EntericBio Gastro Panel II (SeroSep). Sixteen stool specimens from the outbreak were sent to Cryptosporidium Reference Unit, Wales.

Results

Epidemiological Results

A total of 54 laboratory confirmed *cryptosporidium* cases were notified from 23rd July to 6th August. Of these cases, 40 were part of the outbreak as specified by the outbreak case definition (33 were classified as confirmed cases and 7 as possible cases).

Of the confirmed cases, two were likely secondary transmission as household contacts of a case. Two cases diagnosed outside of Dublin had both recently eaten in an implicated food premises in Dublin.

Dates of symptom onset ranged from 16th to 29th July with a peak of 12 cases on 23rd July (figure 1). Table 1 displays the descriptive analysis of the 40 cases linked to the outbreak. Thirty one cases (76%) were aged 20 – 40 years old. The minimum age was 3 years and the maximum age was 74 years. Thirty one cases (76%) were resided in the South Dublin and North Wicklow area. Fourteen cases (35%) required inpatient hospital treatment.

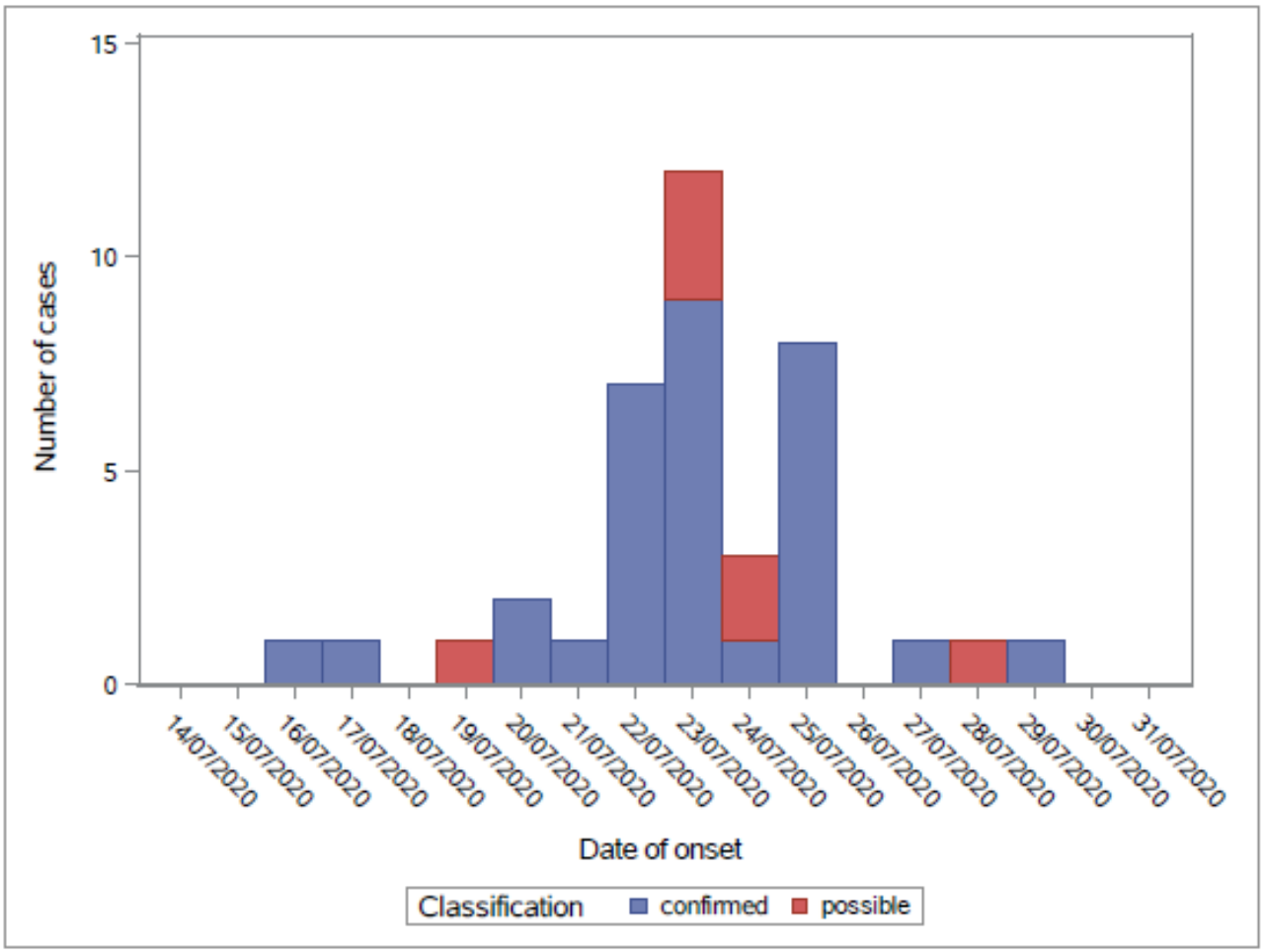

Figure 1: *Epidemic curve by date of onset for 40 cases of cryptosporidiosis linked to the foodborne outbreak in the Greater Dublin area in July 2020.*

Table 1: *Descriptive analysis of 40 cases and isolates of cryptosporidium linked to the foodborne outbreak in the Greater Dublin area in July 2020.*

	Confirmed (n=33)	**%**	**Probable (n=7)**	**%**	**Total (n=40)**
Sex					
Female	21	(63.6)	4	(57.1)	25
Male	12	(36.4)	3	(42.9)	15
Age group					
1-19	4	(12.1)	1	(14.3)	5
20-29	17	(51.5)	1	(14.3)	18
30-39	9	(27.3)	4	(57.1)	13
40-49	1	(3.0)	1	(14.3)	2
50-59	1	(3.0)	0	(0.0)	1
>60	1	(3.0)	0	(0.0)	1
Public Health Area					
South Dublin/Wicklow	28	(84.9)	3	(42.9)	31
West Dublin/Kildare	4	(12.1)	2	(28.6)	6
North Dublin	0	(0.0)	1	(14.3)	1
Other	1	(3.0)	1	(0.0)	2
Patient diagnosis					
Community	14	(42.4)	5	(71.4)	19
Emergency Department	6	(18.2)	1	(14.3)	7
Hospital inpatient	13	(39.4)	1	(14.3)	14
Genotype					
IIaA18G3R1	11	(84.6)	1	(33.3)	12
PCR negative	1	(7.7)	1	(33.3)	2
Un-typable	1	(7.7)	1	(33.3)	2
Not typed					24
Swimming					
No	16	(76.2)	1	(33.3)	17
Yes	5	(23.8)	2	(66.7)	7
Unknown					16
Travel					
No	17	(77.3)	3	(100.0)	20
Yes	5	(22.7)	0	(0.0)	5
Unknown					15

Given the geographic clustering of cases, a survey of all public and private hospital laboratories in five surrounding public health areas was conducted to establish whether testing for *Cryptosporidium* was part of routine stool sampling protocol (Table 2). Of the 18 laboratories surveyed: 8 (44%) screened routinely using PCR method, while 10 (56%) tested only if specifically requested.

Table 2: *Cryptosporidium testing protocol in 18 hospital laboratories across 5 public health areas.*

Public Health Area	Hospital laboratory	Cryptosporidium testing protocol of stool samples
South Dublin/Wicklow	A	Routine PCR
	B	On request
	C	On request
West Dublin/Kildare	D	On request
	E	On request
	F	On request
	G	Routine PCR
	H	Routine PCR
	I	Routine PCR
North Dublin	J	On request
	K	On request
	L	On request
	M	Routine PCR
South-East	N	Routine PCR
	O	Routine PCR
North-East	P	On request
	Q	On request
	R	Routine PCR

Environmental Results

All inspected food premises were supplied with water by the public mains system. Ongoing monitoring by the utility company recorded no detection of *Cryptosporidium* and there had been no reported breaches at water treatment plants supplying the area.

A large number of food premises were implicated by food history questionnaire. Five food premises (A, B, D, M and R) were linked to at least three cases each, with symptom onset clustered from 20th July to 25th July (figure 2). Of the 40 total cases, 31 ate at restaurants that sourced salad from a common supplier farm.

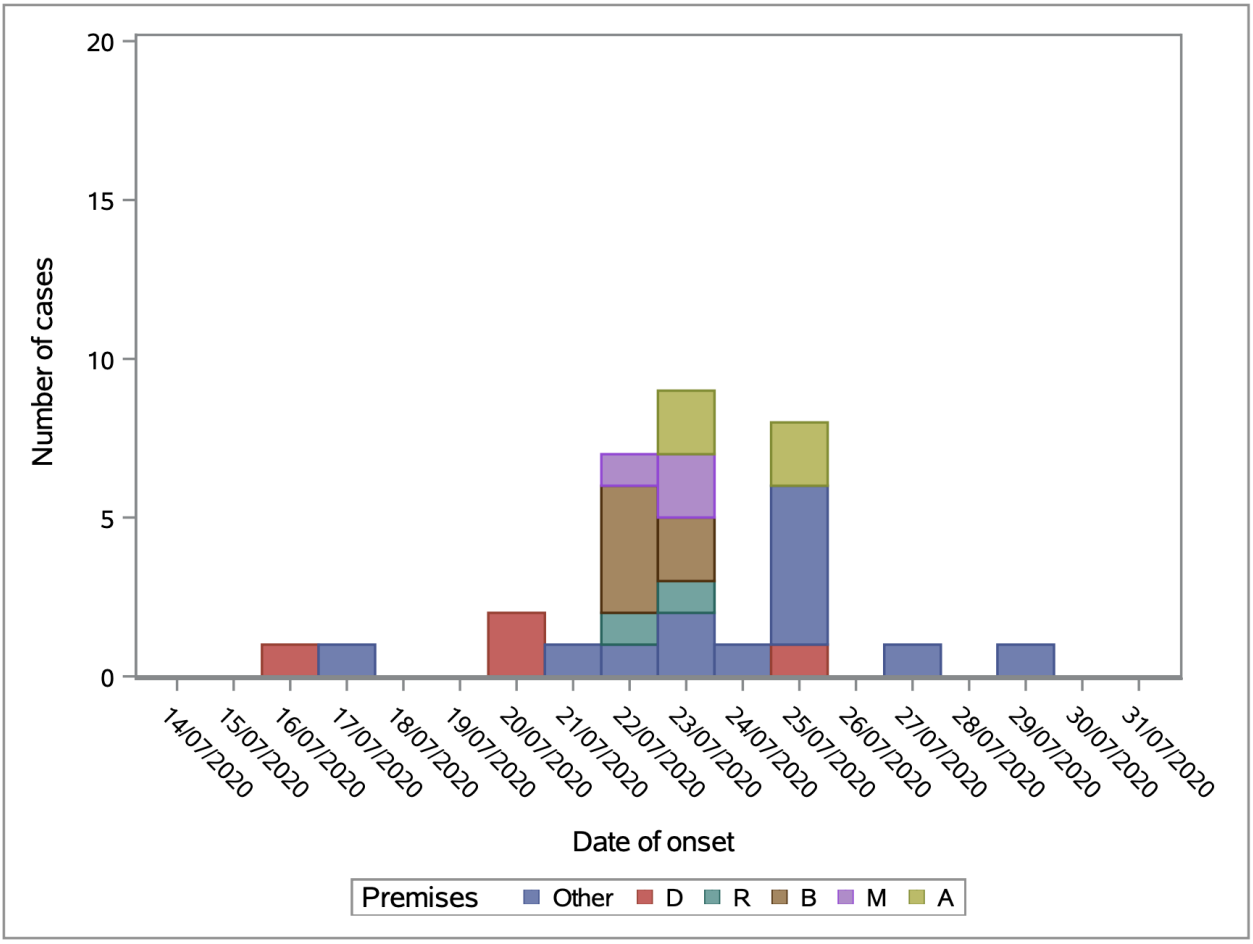

Figure 2: *Epidemic curve of the 33 confirmed cases of cryptosporidiosis linked other the foodborne outbreak by food premises in which the case ate in July 2020.*

The farm owner reported no irrigation of the crops since early June due to adequate rainfall. The crop field did not receive any slurry, straw or organic manure pre- or post-cultivation and was not at risk of flooding and there were no obvious sources of contamination on inspection.

It was noted that a well head on the farm was not adequately protected at the surface or lined to prevent ingress of surface water run-off or shallow groundwater, leaving it vulnerable to contamination. Water testing results from the well were negative for *Cryptosporidium*, *E. coli* and *Enterococci*.

Data from the weather station close to the farm showed that there had been a number of heavy days of rainfall in June following minimal rainfall in May. The largest single day of rainfall measured 20.1 millimetres and occurred on the 20th June. This was within the growing period (28 – 35 days) of the later implicated salad leaves.

Microbiology Results

Sixteen stool specimens from the outbreak were sent to Cryptosporidium Reference Unit, UK, from which 14 PCR positive isolates were identified as *C. parvum* species. Subsequent gp60 genotyping identified subtype IIaA18G3R1 among 12 of the 14 isolates. The remaining two samples could not be typed.

Testing of salad samples did not detect *Cryptosporidium* oocysts or *Giardia*. Two batches of salad were also collected from the only other customer of the farm. Testing of these samples failed to detect *Cryptosporidium* oocysts.

Discussion

The OCT instituted a number of control measures to mitigate the effects of contamination, trace the source of infection and reduce the risk of similar future outbreaks.

Surveillance alerts were issued to regional Public Health Departments, local GPs, hospital microbiologists and Emergency Departments on 29th July. Recommendations issued to Farm A included: fencing off the salad crop field; remediation work to the well head at Farm A, installation of UV disinfection equipment, and washing of salad produce by food premises before use. A product re-call of the seasonal salad box was issued on 4th August as a precaution.

Clustering of cases in place and time suggested a point source outbreak. Although initially focusing on water-based exposures the OCT quickly refocused to food as the potential source of infection. The predominant age range of our cases (20 to 40 years) likely reflected restaurant dining habits as the point of contamination, and the advice given to those over 70 years of age to restrict movements in effect at the time due to the COVID-19 pandemic.

Cryptosporidium parvum is present in a wide variety of animals, particularly sheep and cattle, while IIaA18G3R1 is the predominant gp60 subtype found in Ireland [13, 15]. This was consistent with samples genotyped in this outbreak but, unfortunately, could not further localise the source of infection. Given the three day shelf life of the salad box and the symptom onset date of cases, negative food sample testing cannot rule out contamination of previous salad batches which were not captured in these samples. Ultimately, no microbiological link between the cases and Farm A was established.

Contamination of produce can lead to large foodborne outbreaks. However, cases of cryptosporidiosis are likely under-reported for multiple reasons. Patients may not attend their doctor for testing due to poor awareness of *Cryptosporidium* and the self-limiting nature of symptoms in most cases. Routine laboratory surveillance of *Cryptosporidium* is not robust in Ireland (Table 2). Detection is therefore dependent on awareness among doctors to specifically request *Cryptosporidium* testing. There is a similar lack of harmonisation at a European level [6].

Ultimately, this investigation highlights the surveillance value of routine PCR screening of stool samples for *Cryptosporidium*, which facilitated early detection and management of this outbreak. In order to accurately measure the incidence of *Cryptosporidium* infection in Europe, a comprehensive, uniform surveillance system is needed.

Declaration of Conflicts of Interest:
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Establishing or Excluding a Diagnosis of Fetal Valproate Spectrum Disorder is a Multi-layered Process

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Abstract

Background

In 2017/2018, the Health Products Regulatory Authority issued new guidance on the prescription of Sodium Valproate (VPA) to female patients of reproductive age. A review was initiated of VPA exposed individuals to identify whether previously unascertained cases of VPA related Embryopathy could be identified.

Methods

Forty patients under twenty-three years of age were reviewed.

Results

Eleven (27.5%) new cases of Fetal Valproate Spectrum Disorder (FVSD) were identified. Twenty-four (60%) cases were felt not to satisfy diagnostic threshold for this teratogenic disorder. Five (12.5%) cases were indeterminate. Six of the forty patients (15%) had an alternative genetic cause of developmental delay established.

Conclusion

There is increased awareness regarding avoidance of VPA use in women of childbearing age. An equal awareness is warranted that developmental delay in the context of VPA exposure in pregnancy does not necessarily constitute a diagnosis of FVSD but that other competing diagnostic hypotheses have to be considered.

Introduction

The recognition of Sodium Valproate (VPA) as a teratogenic agent dates from 2 seminal papers (Di Liberti et al., 1984; Winter et al., 1987)[1, 2] in both of which the stream of single cases of suspected VPA related birth defects which had followed upon the first report (Dalens 1980)[3] were consolidated. Ardinger et al.[4], reviewed 15 cases and identified developmental delay or neurological abnormality as a major finding (67% of cases). The syndrome was distilled by the landmark report from Clayton-Smith and Donnai (1995)[5] whose paper identified both dysmorphic features and congenital malformations which had come to be recognised as constituent elements of the syndrome. Among the most identifiable dysmorphic facial features are trigonocephaly, infraorbital grooves, flat nasal bridge, a broad nasal root with anteverted nares and a shallow philtrum, while the more commonly associated congenital malformations include neural tube defects, congenital heart disease, cleft lip and palate and tracheomalacia. Latterly the name of the condition has been changed from Fetal Valproate Syndrome (FVS) to Fetal Valproate Spectrum Disorder (FVSD).

While the newly emerging syndrome was initially greeted with some scepticism by the Neurology community[6], this phase of uncertainty is now past and the association between the drug and the teratogenic consequences are widely accepted and recognised[7].

Epilepsy is common, 1 in 115 people in Ireland having epilepsy[8]. Accordingly, there are approximately 10,000 women of childbearing age who require management of epilepsy, including during pregnancy. This can present considerable challenge to the managing neurologist[9].

VPA is a first-generation anti-epileptic drug (AED) which is effective in the treatment of different types of epilepsy including absence seizure, myoclonic and generalised tonic colonic epilepsy. It is also used as a mood stabiliser in patients with bipolar disorders. It has also been used for acute and preventive treatment of episodic migraine. It has been used commonly in Europe since its licence in 1970s due to its high effectiveness[10].

The current risk of all forms of major congenital malformations with VPA is approximately 10% which is considerably higher than the general population and population of children with antenatal exposure to other AEDs[11].

There have been many cautionary articles about the risk benefit ratio of VPA in pregnancy[9]. Writing in this journal in 2011, one of the current authors stated his view that VPA was probably the major avoidable source of teratogenic consequence at present [7]. Stemming from these published concerns, the European Medicine Agency held a public hearing on the issue in September 2017 and new measures to avoid valproate exposure in pregnancy were endorsed in March 2018 [12]. In April 2018 the Pharmacovigilance Committee of the European Medicines Agency and the Health Products Regulatory Authority (HPRA) issued new contraindications on use of VPA[13], strengthened warnings to minimise the prescription use of this agent in pregnancy with a view to minimising future damage. According to the new regulations, valproate should not be used in female children, girls and women of childbearing potential unless other treatments are ineffective or not tolerated [12,13].

The Health Service Executive (HSE) established a follow up pathway for women of childbearing age on VPA[14]. According to this pathway all GPs should discuss contraceptive options with them, and GPs need to ensure that they are reviewed by a specialist annually. All specialists (Neurologist/ Psychiatrist) need to ensure that women of childbearing years on VPA have an annual risk assessment form completed. Women have to read, complete and sign this form during a visit with the specialist: at treatment initiation, at the annual visit, and when a woman plans a pregnancy or is pregnant. Current estimates, based on public health data analysis, suggest that over 3000 women were prescribed VPA during pregnancy in the 40-year period 1975-2015[15].

Constituent to this revised awareness of the potential harmful effects of VPA, the HSE agreed that offspring of Mothers treated with VPA and about whom there was a concern as to whether these patients had VPA related embryopathy or attributable features thereof were referred to a specialist assessment clinic established for this sole purpose at CHI Crumlin. The purpose of this communication is to report the findings in 40 such cases assessed by the authors.

Methods

Forty patients were reviewed in the special purpose clinic following referral from GPs, Paediatricians and Neurologists from all over the country on the advice of HSE. Information was collected and systematically recorded according to a set pro forma. Evaluation was focused on maternal diagnosis of epilepsy, age when VPA was commenced and in what dose; whether it was the only AEDs or if polytherapy applied, what other medications were taken. Information regarding pregnancy was collected including pregnancy scans, foetal growth, seizures in pregnancy or any other complications. Birth history was documented including their mode of delivery, birth weight and whether small for gestational age or not. It was noted if they were breast fed or bottle fed. Symptoms of neonatal withdrawal were sought. A history of admission to neonatal unit was taken and if any intervention was needed. Developmental history including possible indicators of developmental delay was a particular focus. Detailed evaluation of pre-existing medical records was undertaken, and we noted all the previous diagnoses reached including developmental delay, autism, dyspraxia or dyslexia and the relevant community services and extant reports.

A detailed medical and family history was also taken. Clinical examination included general physical and systemic examination, growth characteristics by percentiles on growth charts.

Microarray and Fragile X testing was performed on all the children. All patients were evaluated by a Clinical Geneticist and Whole Exome Sequencing was performed with written consent. After full analysis of all the findings, some of these patients were confirmed as true cases of Fetal Valproate Spectrum Disorder, some received an alternative diagnosis not related to the VPA exposure, and some cases were indeterminate.

Results

The total number of patients seen under this HSE scheme was forty, the eldest of whom was twenty-three years and the youngest was two years of age at time of assessment. Of these eleven (27.5%) patients could clearly be established as previously unconfirmed cases of FVSD, twenty-four (60%) cases did not satisfy diagnostic criteria for that condition as currently constituted [16] and five (12.5%) cases were indeterminate.

Six patients among the twenty-four cases (25%) who did not satisfy diagnostic criteria for FVSD had an alternative diagnosis established by investigation. Three of these six cases had a demonstrable microarray abnormality, shown to be *de* novo in two and maternally inherited in the third instance, and such as to establish a high likelihood of pathogenic basis. Microarray findings which were familial or deemed benign variants were discounted.

A further three patients were shown to have single gene mutations, known or considered highly likely to be pathogenic according to standard criteria and in these patients a specific single gene causation was ascribed. All three genes identified are known to be causal of developmental delay. Details are given in Table 1.

Illustrative Cases (Maternal prescription of VPA confirmed in all instances).

Case 1 is a now twenty-three-year-old man born with unexpected lumbosacral spina bifida, managed surgically. He subsequently required a Ventriculo-Peritoneal shunt and had four subsequent re-siting procedures for his shunt. He now weight bears in a static position but essentially needs a wheelchair for most daily activities, has no sphincter control and has had a limited response to intensive educational input. He is almost wholly reliant on his mother, his main carer. Clinically he has many features described in association with VPA exposure (Figures 1 and 2) including bilateral hypoplasia of the thenar eminence and thumb digitisation, slightly short palpebral fissures and malar flattening. Given the spina bifida and facial features, albeit mild, a diagnosis of FVSD was made.

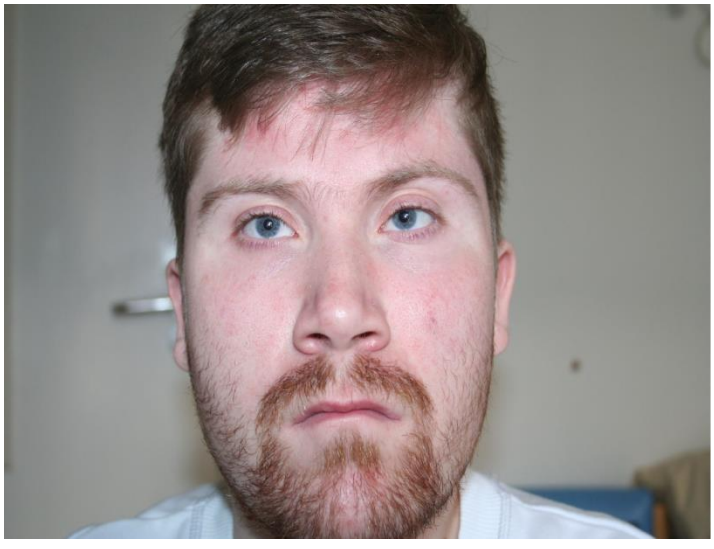

Figure 1.

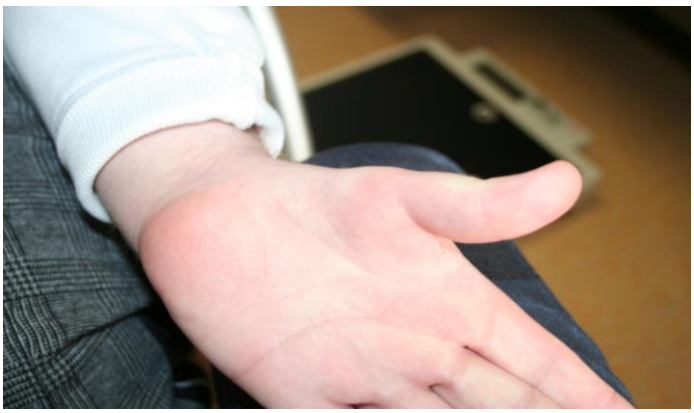

Figure 2. *(a)-Left Hand*

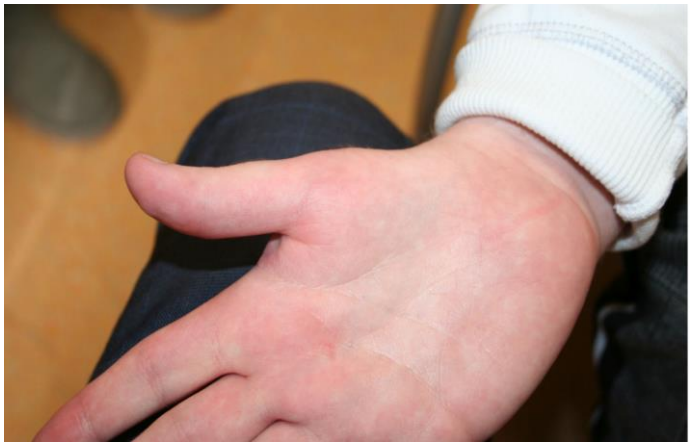

Figure 2. *(b)-Right Hand*

Case 2 is a now nine-year-old boy who presents with significant developmental delay. His speech was slow, he now attends a special Autism Support Unit in school, is somewhat clumsy in motor evaluation and has marked joint laxity clinically at the elbows but not involving other joints – Beighton score 2/9. The hands, specifically the thumbs are normal. His facial characteristics are demonstrated (Figure 3) with small palpebral fissures, epicanthic folds (R >L), broad nasal root, featureless philtrum and thin upper lip. It was considered likely that his condition represented FVSD.

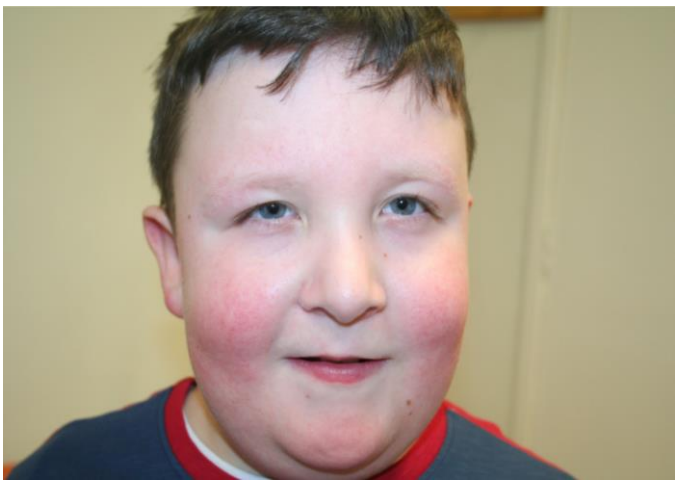

Figure 3.

Case 3 is a seventeen-year-old man, described as severely intellectually impaired and who has always been in special education. He is non-verbal, has no selfcare skills and requires full time care. There were no clinical features suggestive of FVSD. There is a strong maternal family history of epilepsy and possibly educational sub-normality. This patient has two similarly affected brothers who were not exposed to VPA *in utero*, as maternal medication had been changed further to the birth of her eldest son and the recognition of his developmental problems. Obviously, a diagnosis of non-specific X-linked mental retardation is much more likely in this situation, although no identifiable mutation came to light on whole exome screening.

Case 4 is a now twelve-year-old girl with a history of microcephaly, developmental delay and autistic spectrum disorder. She was non-dysmorphic clinically. Extensive paediatric neurological examination and assessment previously undertaken had been supported by a normal MRI brain scan, normal microarray investigations of the chromosomes and detailed, ultimately negative, investigation for myasthenia gravis after ptosis had developed at age 4 years. Whole Exome Sequencing established a *de novo* mutation within the *BRSK2* gene in a highly conserved acceptor splice site. Mutations at this locus are known to cause developmental delay, microcephaly, speech delay, attention deficit and autistic spectrum disorders. A diagnosis of developmental delay consequent on *BRSK2* mutation was returned.

Case 5 is a now fifteen-year-old girl born with metopic suture synostosis and who underwent cranial reconstructive surgery at age two years. She had progressed through mainstream school, but Educational Psychology assessment showed significant deficit in social skills and she was classified as having autistic spectrum disorder. Her facial findings were not strongly suggestive of FVSD, other than for small palpebral fissures. However, her left thumb was notably abnormal with absence of the interphalangeal crease and hypoplasia of the thenar eminence relative to the contralateral side (Figure 4). The combined clinical features of metopic synostosis and thumb abnormalities clearly signalled the diagnosis of FVSD.

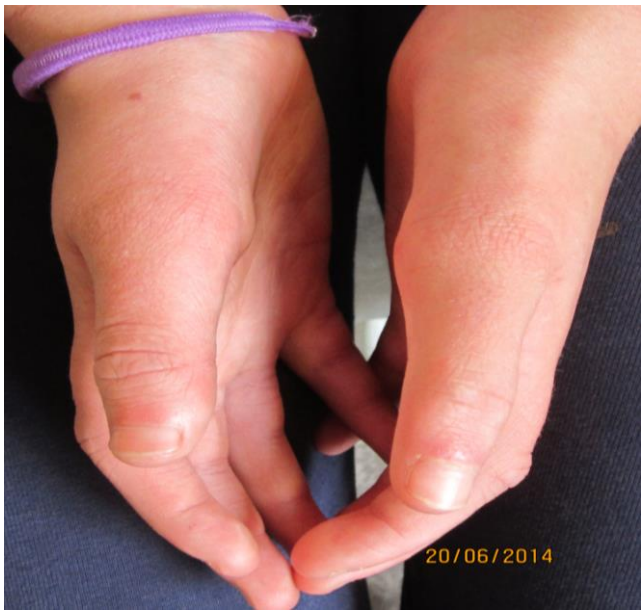

Figure 4.

Table 1: *Data of 6 patients in whom a likely genetic basis of developmental delay was established, notwithstanding VPA exposure in pregnancy.*

Patient	**Array**	**WES**
Male	*De novo* Xq dup 3Mb	Negative
Male	Xp dup 1.7Mb (mat)	Negative
Female	15q13.2 2.1Mb dup *De novo*	Negative
Male	Normal	*SCAG1 gene* Pathogenic intragenic deletion
Female	Normal	*BRSK2 gene* Splice-site pathogenic mutation
Male	Normal	*PURA gene* *De novo* missense mutation

Discussion

Although the condition of FVSD has been known for over twenty-five years, establishing the diagnosis can be demanding. Obviously, some cases pose less diagnostic challenge than others. For instance, the known association with trigonocephaly [17] considerably eases the diagnosis in a case presenting with metopic suture synostosis, even when the facial features may be unconvincing to the experienced eye (Case 5). However, as the illustrative cases show, an open mind as to underlying diagnosis is essential if sensible diagnostic conclusions are to be reached in individual cases.

Clayton-Smith et al., published revised diagnostic criteria in 2019 [16]. An interesting development accepted by this Expert Group is that typical facial features are no longer an absolute requirement to reach the diagnosis of FVSD, whereas this had historically been considered essential to the diagnosis. The essential elements of concluding a diagnosis of Fetal Valproate Spectrum Disorder under the revised criteria now involve;

1. Confirmed exposure to VPA in pregnancy,
2. No recognisable diagnosis to account for the phenotype,
3. Normal microarray and Fragile X syndrome studies,
4. Other teratogenic disorders with overlapping clinical phenotype are excluded in particular Fetal Alcohol Syndrome [18].

Additionally, suggestive features of facial dysmorphic findings, spina bifida, congenital cardiac defects, laryngomalacia, metopic suture synostosis and a joint laxity score of Beighton 6/9 or more are recognised.

Social communication disorders/autistic spectrum diagnosis is recognised to occur in perhaps 6-15% of all cases of FVSD. In our experience, this group of patients presented the most significant diagnostic challenge. Several patients were seen in whom a history of VPA ingestion was considered by parents, and sometimes by their doctors, as causal of their later diagnosis of autistic spectrum disorders, even in the absence of malformations or dysmorphic features which might generally be expected to attend FVSD cases. Even with the revised diagnostic criteria [16] which accept that facial features are not essential to the diagnosis, it is impossible to return a diagnosis of FVSD to patients whose sole neurological finding is autism or variants thereof. Several parents of patients presented for the assessment found this hard to accept and indeed rejected the findings in some instances. However, familial autism studies show that a genetic basis to autism is now a well-established, peer-review published and widely accepted phenomenon. Multiple genetic determinants of familial autism are identified, including rare *de novo* single gene changes, copy number variants, single nucleotide variants and autism spectrum disorder is also confounded by variable penetrance and pleiotropy[19]. For this reason, although unpalatable to carers and parents, some cases in whom autism is the predominant clinical finding cannot be considered to satisfy diagnostic thresholds.

In some instances, the clinical examination clearly identifies the syndrome solely on the basis of the dysmorphic findings. In other instances, with less clear-cut dysmorphic findings, a history of the neonatal period can be especially enlightening, especially of enquiry is specifically made for laryngomalacia [20] or congenital heart disease [5]. In further cases the true cause of the developmental delay has emerged from the absence of typical clinical findings but from the interpretation of the family history, while other patients have been shown to have genetically independent findings, both chromosomal and single gene in nature, which offer adequate and likely explanation for the clinical presentation, according to current guidelines of variant classification[21].

The recent consensus statement from the European Reference Network for Congenital Malformations and Intellectual Disability has recommended the new guidelines both for the diagnosis and management of children with Fetal Valproate Spectrum Disorder (FVSD), incorporating new diagnostic criteria [16]. The term FVSD includes all the cases from major congenital malformation to neurodevelopmental delays. The term is used in a similar way as fetal alcohol spectrum disorder[18]. Despite using the FVSD term, it remains difficult to diagnose this condition due to the non-availability of any specific diagnostic test or biomarker.

The new revised diagnostic criteria include the essential, suggestive and supportive features. Essential features must be present for the diagnosis of FVSD, Suggestive features are 10% more common in children with FVSD than the general population and supportive features occur in general population but are found more commonly in FVSD, joint laxity of 6/9 or greater being a good example.

Data from public health [15] based on Irish birth data from 1975 to 2015, suggests that 3126 babies were potentially exposed to VPA in-utero in that time period. 873 of these were born between 2000 and 2015. 153-341 may have experienced some form of major congenital malformation from 1975 to 2015, while 1,250 may have experienced some form of neurodevelopmental delay from 1975 to 2015. These data suggest that the group of cases we have seen and report upon may only represent a minority of exposed cases.

All of our confirmed affected children fulfilled the essential criteria for FVSD, with normal microarray and Fragile X and no other diagnostic reason for their developmental difficulties on investigation. They did not have any exposure to any other teratogenic agent resulting in these difficulties. They all had required suggestive and supportive features to diagnose them with FVSD.

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Become a Better Teacher Today: Eight Easily Applicable Ways to Improve Your Skills as a Clinical Teacher

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Abstract

In this article we aim to provide busy clinicians with eight easily applicable tools to improve their clinical teaching skills. We encourage use of the adult learning model in postgraduate education, focus on critical thinking, encourage engagement, and use of active teaching strategies such as concept maps. We describe role modeling of behaviour, provision of feedback, and the role of bedside teaching. We approach this with a "what", "why" and "how" model that provides a practical means to introduce new techniques in a time limited environment.

Introduction

A major challenge dominating the modern era of post-graduate medical education is meeting learners' needs without detracting from clinical service. Doctors in training state a need for increased opportunities to pursue subjects in depth, spend time with patients, and participate in discussions with teachers and mentors.[1] One solution to the conflict between clinical services and educational needs is to explore educational opportunities that arise in day-to-day practice and maximize the efficiency of those opportunities. Here we present eight low effect, high impact strategies that can easily be incorporated into daily clinical practice to better enrich the learner and teaching experience.

Creating an environment conducive to learning: Adopting an adult learning approach

What?

Adult learning differs from childhood learning. The main difference being adults are differently motivated.[2] Adult learning theory acknowledges that adult learners must have a "need to know" to effectively engage with concepts, topics, or material.

Three main ways in which this manifests are: 1) Based on life experiences, adults bring more to the learning environment and expect that these experiences should be valued and respected, 2) adults relate new learning to their past experiences, and 3) adults' thoughts, beliefs, and knowledge is more fixed, and as learners, adults need to be challenged to recognize this. Recognition of learning goals in this setting is imperative.

Why?

In practice, adults benefit from experiential learning in an environment of mutual respect. Historically, this was not the case, with Tim Swanwick (2008) classifying three forms of teaching that occurred as "the sage on the stage", "hanging around with the big boys" (or "learning by lurking"), and "teaching by humiliation".[3] None of these forms of teaching are based on adult learning theory or foster a productive environment for adult education.

How?

In adult learning, a greater focus on practical applications (e.g., case-by-case, patient-centred, bedside education) and a culture of mutual respect is required. Small group discussions, rather than didactic lectures, better facilitate adult learning. Learners should be challenged to open previously fixed ideas. Strategies that support this include 1) knowing and understanding learners' prior experiences to optimally contextualize topics for them, 2) appreciating learners' perception of their 'need to know' and working to optimize their perspective of the importance of the topic, and 3) treating learners with respect and avoid teaching with humiliation strategies.

Abandon hierarchy: Make learning a level playing field

What?

The hierarchy of medicine is exemplified by consultants expecting (or allowing) learners to refer to them as "Dr. X". To foster the adult learning environment of mutual respect, a horizontal power structure is preferred.

Why?

Referring to a consultant by their first name only begins to break down the hierarchical structure of a medical team but doing so contributes to a safe learning environment and functions to intensify meaningful communication. Learners are more likely to admit confusion if hierarchy is de-emphasized, and a collegial, collaborative relationship between the learner and teacher is prioritized.

How?

Consultants cannot be unapproachable or intimidating figures. Removing hierarchy facilitates a free exchange of ideas and learners feel enabled to admit areas of uncertainty, allowing the consultant to focus on concepts that may be confusing or misunderstood.

Tools for Critical thinking: The importance of asking "why?", discouraging "reporters" and using *silence*

What?

Learners can be stratified by the RIME paradigm; Reporters, Interpreters, Managers, and Educators.[4] To evolve from reporting to interpreting, consultants must encourage learners to practice processing and synthesizing clinical data, going beyond simply reporting clinical information without analysis or interpretation. Asking "why?" invites the learner to offer their reasoning and describe their thought processes and rationalization. Additionally, appropriate use of *silence* can encourage contributions, and promotes discussion and interaction, as opposed to didactic teaching styles. [5]

Why?

Asking "why?" encourages the learner to expand upon their understanding, promotes growth by helping learners go beyond rote reporting of clinical data, and allows teachers to identify knowledge gaps to guide future teaching.[6] Evolving from 'data gatherers' to being able to process and synthesize medical information is a fundamental goal for learners as they progress from trainees to autonomous clinicians.

How?

Teachers must be comfortable allowing learners to demonstrate their understanding of *how* clinical data leads to diagnostic considerations. Asking "why?" invites an assessment ("Why do you think that is the most likely diagnosis?") and allows the teacher to probe the learners' reasoning and understanding. To use silence after posing a question, a teacher should silently count to ten before speaking to encourage learners to respond. [5]

Concept mapping: Physiology based teaching

What?

Concept maps are graphic depictions of learners' knowledge and understanding, which encourage learners to develop strategies and provide frameworks of understanding rather than lists of diagnoses. [7] Figure 1 is an example of a concept map on this topic.

Why?

There is substantive cognitive value in graphically depicting one's understanding of a clinical topic/concept. Encouraging learners to develop their own concept maps can reinforce mechanistic and clinical relationships.[8] Additionally, making links between different clinical signs or symptoms and physiologic and pathophysiologic processes can reinforce deeper understanding of a clinical problem.

How?

Independently developing a concept map can be intimidating, so demonstrating how to develop a concept map may encourage learners to use them in their own learning. Similarly, identifying appropriate topics for concept maps is important. Focused questions (e.g., "How does emphysema cause wheezing?") are more amenable to concept mapping than broad, general questions (e.g., "What are causes of chest pain?").

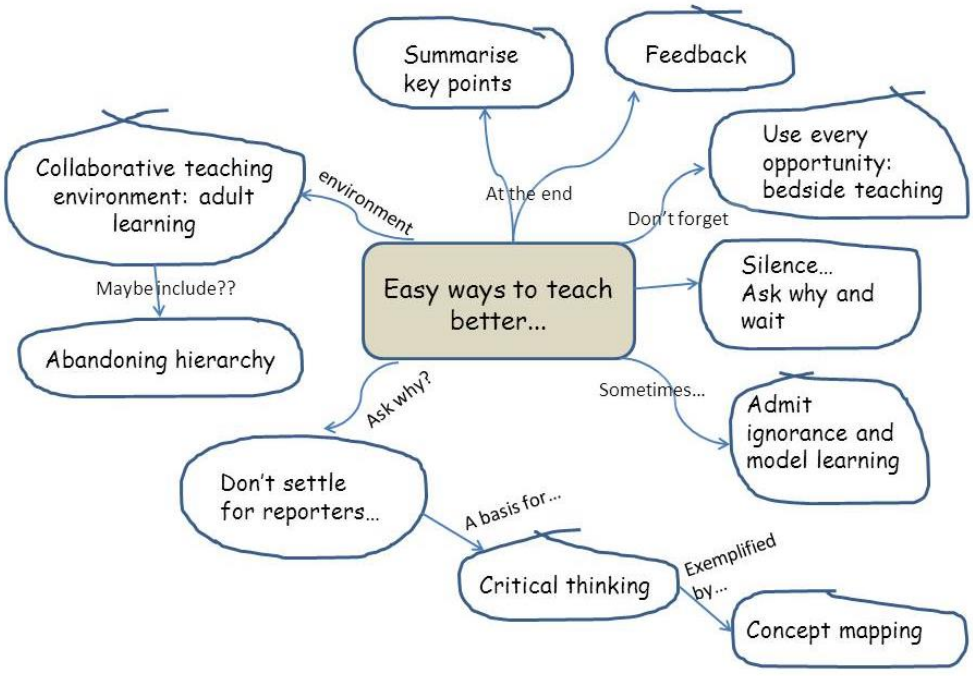

Figure 1: *Concept map depicting easy ways to teach effectively.*

Admit ignorance

What?

Consultants or teachers don't know everything and modeling how to deal with uncertainty or a knowledge gap is important for learners' growth. Specifically, demonstrating that practicing clinicians are not infallible emphasizes that medical practice involves lifelong learning.

Why?

Even if learners are taught how to use medical information resources, accessing such resources in the context of point-of-care clinical work is not typically explicitly taught. Therefore, when consultants admit unfamiliarity with a question and then demonstrate how to address that knowledge gap, learners are exposed to practical learning.

How?

Rather than feign expertise, consultants should admit uncertainty and then model *how* they would address uncertainty by performing a literature search with the learners. This behaviour supports the development of self-directed learning skills which enable the learner to access the medical literature in an efficient manner, promoting personal and career development.

Never miss an opportunity: Bedside teaching

What?

Eliciting physical exam findings and teaching in context is a mainstay of medical education, but currently less than 25% of clinical teaching occurs at the bedside.[9] Contrary to common beliefs, patients enjoy bedside teaching encounters,[10] but barriers including quick patient discharges and reliance on imaging exist.

Why?

Bedside teaching is an opportunity to develop the concepts already discussed on ward rounds or teaching sessions. It is a chance to role-model the physician-patient interaction. This should be done whilst keeping the session learner-centered, rather than engaging in self-promoting displays by the consultant for the learner and/or patient.

How?

We need practical steps to help us move out of the corridors and back to the bedside.[11] Ensure the skill being thought corresponds to the learners' needs, abilities, and past experiences (see Tip 1). Construct a lesson plan and share this with the learners. Plan to keep all of the group engaged (e.g., assigning tasks, develop discussion questions in advance).

Involve the patient, preparing them for the experience sets up modeling of the patient-centered practice and attitudes throughout the teaching session. Finally, challenge the learners with questions and encourage performance of appropriate interviewing, counseling and physical exam skills.

Feedback in the moment

What?

Feedback is "information describing performance in a given activity that is intended to guide future performance" [12] and is integral to the process of clinical learning.

Why?

In the era of outcome-based medical education, learners are expected to achieve milestones, and, if done well, feedback may assist this process. Trainers often believe they offer frequent and appropriate feedback, however trainees often think they receive infrequent and ineffective feedback.[13]

How?

We need to recognize the goals of the learner and provide specific feedback describing objective behaviors (and not subjective impressions) based on direct observation.[14] Feedback needs to happen regularly so it's an expected part of training. Giving feedback closer in time to the behavior that needs correction gives the learner a better chance to change.

Summary and Reflection

What?

Recapping on learning points gained in a clinical teaching scenario is a final opportunity to embed knowledge within the learners' scaffold of pre-existing knowledge.

Why?

Either inviting the learner to recap salient learning points or working together to summarize leverages Bloom's Cognitive Taxonomy.[15] Bloom's Taxonomy describes a gradation of the higher orders of thinking; starting with basic knowledge recall, developing through comprehension, application and analysis and culminating in synthesis, and ultimately evaluation of the new learning. Also, by asking the learners to summarize, the teacher identifies knowledge gaps which will be addressed in future teaching sessions.

How?

"What did we learn today?" can introduce the summary. The teacher keeps things moving, acknowledging unexpected learning points and reiterating the learning objectives achieved and, finishing by recapping on learning points to consolidate.

Conclusion

Working in medicine means working in an environment where teaching is expected. Using low effort, high impact strategies described here allows us to identify teaching opportunities and make the most of them. By improving our own teaching skills we'll benefit our learners through simpler learning interactions and benefit ourselves through improved job satisfaction.

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The authors have no conflict of interest to declare.

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Discussion and Documentation of "Do Not Attempt Resuscitation" Decisions in an Inpatient Population

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Abstract

Aims

To audit practices around discussion and documentation of resuscitation status in our hospital.

Methods

A chart review of all one hundred and six inpatients to audit adherence to hospital "Do not attempt resuscitation" (DNAR) policy.

Results

Mean age was 79.8 years. Twenty-seven patients (25.5%) had a DNAR order in place. No DNAR forms were fully complete. Twenty DNAR forms (74.1%) had not been discussed with the patient or there was no documentation of a reason as to why the decision had not been discussed. Median time from admission to DNAR status was 5 days (range 0-254).

Conclusion

A systematic approach to advance care planning is needed, particularly in older inpatients with frailty. This should be coupled with staff education, to create a culture where discussing and appropriately documenting advance care planning is part of routine care.

Introduction

Survival to discharge is less than 20% for in-hospital cardiac arrest. [1, 2] Discussing resuscitation status and ceilings of treatment should be a routine part of inpatient care, particularly for older people or those with frailty. However, it is frequently neglected until a patient is acutely unwell. The Clinical Frailty Scale (CFS) [3] is a useful tool for providing predictive information about outcomes in older patients. The CFS is routinely determined for older patients admitted to our hospital.

The National Consent Policy recommends that discussions around DNAR orders occur for patients with "an identifiable risk of cardiorespiratory arrest". [4] In the wake of the Covid-19 pandemic, there was renewed focus on making early decisions around ceilings of treatment. [5]

The documentation of discussions about resuscitation can be time-consuming. The discussion itself can be difficult, particularly for acutely unwell patients or those with cognitive impairment. The National Consent Policy recommends that DNAR decisions be made with patients themselves, or with family members if they cannot participate [4] . Decisions should be carefully documented by a senior decision maker. Our hospital's DNAR form reflects these recommendations.

The inpatient population in our model 2 hospital, St. Columcille's Hospital, includes many older patients with frailty, acutely admitted or transferred for rehabilitation. Access to anaesthetics, intensive care or non-invasive ventilation requires transfer to a tertiary centre. Given these limitations, discussing ceilings of treatment and resuscitation status is highly relevant. We aimed to audit existing practices, with a view to improvement.

Methods

A chart review was carried out for all one hundred and six inpatients on one day in May 2019 to audit adherence to the standards of our hospital DNAR policy. Data was extracted on demographics, CFS and resuscitation status. Basic statistical analysis was carried out, using the 2-sample t test to compare groups.

Results

The mean age of inpatients was 79.8 years (SD=12.67). On admission, the mean CFS was 5 or mildly frail (SD=1.46). Sixteen patients (15.1%) had a CFS of 7 or more, and thirty (28.3%) had a diagnosis of dementia.

Twenty-seven patients (25.5%) had a DNAR order in place. Of these, twenty-five patients (92.6%) had their resuscitation status documented in the nursing notes. Twenty-seven patients (100%) had a DNAR form in their medical notes, but none were fully completed. Nine DNAR forms (33.3%) were missing a review date. On thirteen forms (48.2%), the decision had not been endorsed by a consultant. Twenty DNAR forms (74.1%) had not been discussed with the patient or there was no documentation of a reason as to why the decision had not been discussed.

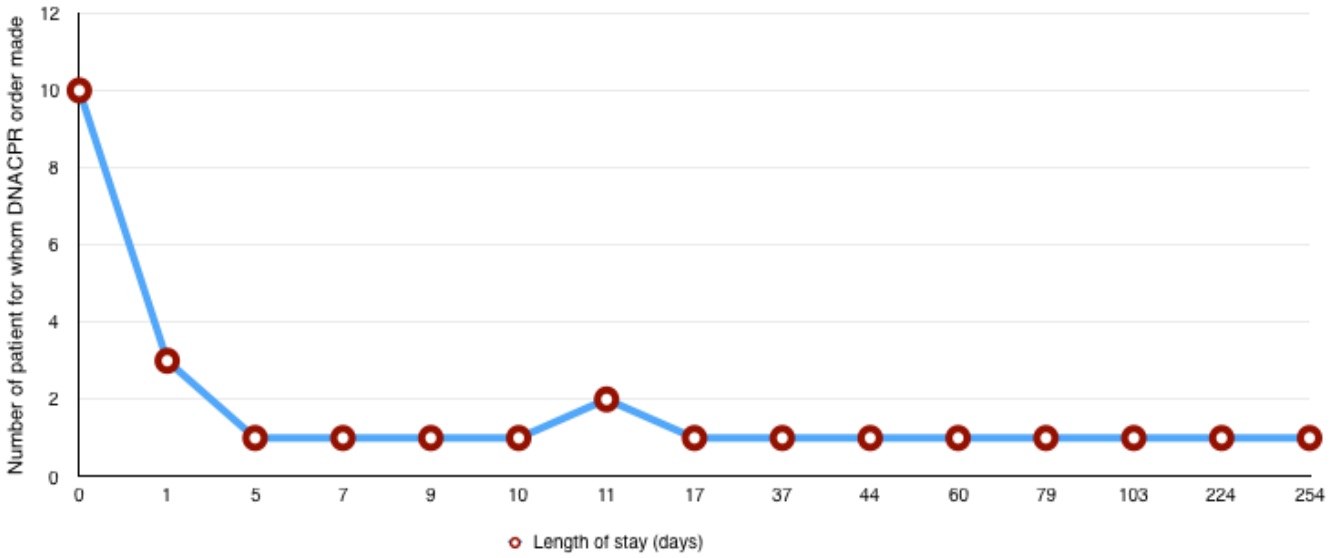

Fig.1: Time from admission until DNACPR order put in place.

Patients with a DNAR order in place were significantly older (85.8 years versus 77 years, p=0.0009) and had a higher CFS (5.8 versus 4.9, p=0.03).

Median time from admission until DNAR was put in place was 5 days (Range 0-254, IQR=37) (Fig.1). Thirteen (48.2%) of those with a DNAR had it in place within 24 hours of admission. This group were significantly older (90.9 versus 81.1 years, p=0.004). Their CFS was not significantly different to those who had a later DNAR order.

Discussion

In our hospital, patients who were older and had a higher CFS were more likely to have a DNAR order, and it was in place at an earlier stage in their admission. While the CFS is not a comprehensive assessment of a patient's functional status, it could be considered when discussing the appropriateness of resuscitation in older people, particularly for doctors who are unaccustomed to these discussions.

The timing of DNAR decisions is also relevant, with sometimes prolonged periods between admission and the DNAR decision being made, reflecting the lack of a systematic approach to advance care planning. The introduction of Treatment Escalation Plans, which focus on the interventions a patient will or will not receive [6], is one option to consider prior to re-audit. This would be particularly useful for our older population with frailty, to promote routine advance care planning and review.

DNAR forms are seldom completed in their entirety, with important details frequently overlooked. This can lead to confusion around appropriate interventions. [7] Patient and family involvement in discussions is not always documented, contrary to national guidelines. [5] Discussions with patients may not always be appropriate due to an acute illness, but documenting the reasons for their exclusion is the expected standard of care and the focus of staff education.

Although this data was collected prior to the Covid-19 pandemic, reflecting on our practices around discussion of resuscitation status is all the more relevant today. As DNAR decisions are increasingly being made on admission, in the emergency department and on acute hospital wards, our practice should be in line with national recommendations [4]. The ongoing challenge is to create a culture in our hospital where patients are supported by staff members to engage in planning for their future care.

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Satisfactory Implementation of Paediatric Virtual Clinics and the Perspectives of Parents

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Abstract

Aim

To assess whether virtual clinics result in a reduction in unnecessary clinic appointments, whilst maintaining a high parental satisfaction rate.

Methods

Parents of children waiting greater than 36 months were called about the continued need for their appointment. Clinic outcome data was quantified and a phone survey of a random sample of participating parents was undertaken to assess their virtual clinic experience.

Results

66% (154 children) no longer required appointments. 20 parents participated in the phone survey. 90% (18) agreed/strongly agreed that they had enough time to speak to the Consultant/CNS. 80% (16) reported they were satisfied with the telephone consultation. 35% (7) highlighted their frustration at not being contacted sooner. Positive remarks included the personal nature of the phone consultations, and reassurance that their children hadn't been removed from the waiting list. The main disadvantage voiced was the lack of warning for the phone call.

Conclusion

Virtual clinics lead to a reduction in required face-to-face appointments, whilst maintain parental satisfaction. However, it is important to note, our study referenced patients waiting greater than 36 months. Introducing this new type of effective consultation is more important than ever given the need to reduce social interactions during this COVID-19 Pandemic.

Introduction

Even before the onset of the COVID-19 Pandemic, waiting lists to see a hospital consultant were at crisis levels. National Treatment Purchase Fund figures from May 2020 revealed there were 12,300 children on General Paediatric outpatient waiting lists, of which 1,141 were waiting greater than one year[1].

Virtual clinics are a planned contact by the healthcare professional responsible for care with a patient for the purposes of clinical consultation, advice and treatment planning[2]. Much of the available literature in paediatrics pertains to diabetes management, particularly in young adults[3, 4]. A recent randomised control trial comparing virtual clinics with face-to-face consultations for follow-up of patients with inflammatory bowel disease showed non-inferiority and cost-effectiveness[5].

Virtual clinics in the form of telephone consultations were commenced at CHI Temple Street in 2019 to evaluate patients waiting longer than 36 months. The aims of this study were to assess whether they resulted in a significant reduction in face to face appointments whilst achieving parental satisfaction with the service.

Methods

A standardised proforma was devised to enable accurate documentation and ensure efficacy. The Consultant or Clinical Nurse Specialist (CNS) explained what the child had been referred for and asked if this was still an issue. If not, then with the parents' consent the child was removed from the waiting list. If the issue was ongoing, a brief history was taken, and a joint decision was made regarding the need for a face-to-face appointment.

A random sample of parents were recontacted at a later stage in a systematic manner until a target of 20 was met. They were encouraged to speak honestly about their experience, with this being documented in an excel proforma.

Results

Clinic Outcomes

252 patients were booked in over 12 sessions between April and August 2019, the outcomes of which are displayed in figure 1. 232 parents were successfully contacted, of which 154 no longer required appointments. 76 patients were booked into urgent clinics, and three were referred for further investigations only. 19 (8%) parents were unable to be contacted despite repeated attempts. The parents and GPs of these children were sent a letter informing them of their removal from the waiting list and the option of being relisted if required. No later communication was received from these patients.

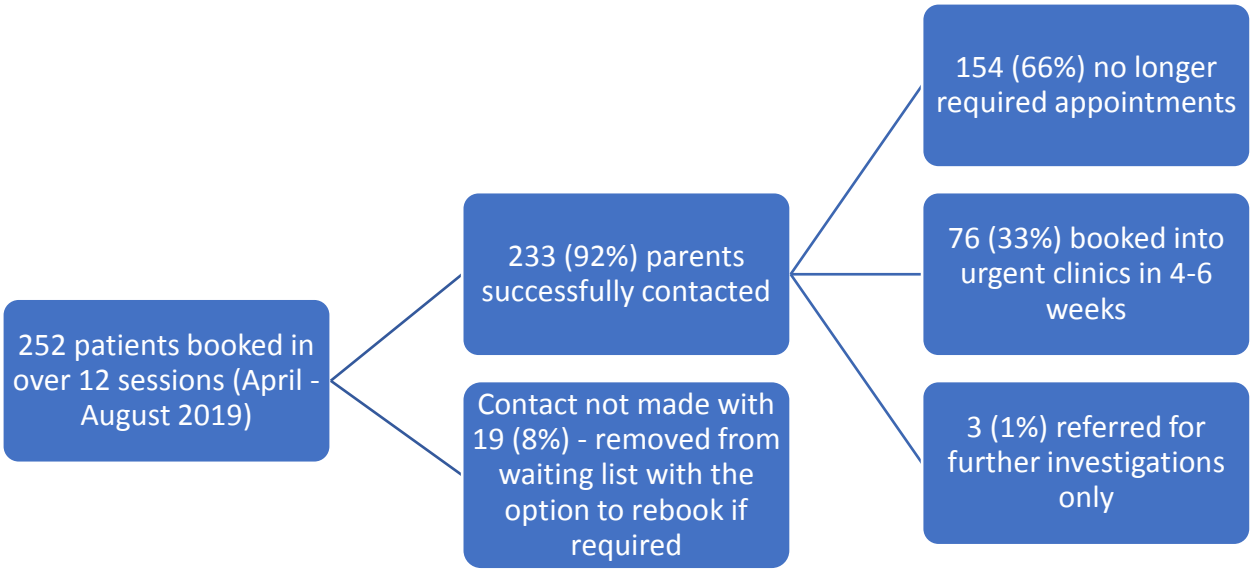

Figure 1: *Clinic Outcome Data: Agreed management plan following virtual clinic consultation.*

Phone Survey

20 parents participated in the follow up telephone survey.

Quantitative Results

55% (11) of parents confirmed they had received a text message prior to the phone consultation; the remainder didn't or couldn't recall. 60% (12) felt inadequately prepared for the phone consultation. 90% (18) felt they had enough time to speak to the Consultant or CNS. 70% (14) felt that their concerns were addressed, while 80% (16) reported satisfaction with the virtual clinic service.

Qualitative Results

Parents praised the personal nature of the virtual clinics, and that their referrals were followed up on even if the issue had resolved. They also highlighted the benefit of not having to take time off work to attend or endure lengthy periods in the waiting room.

Criticism was directed towards the length of time waiting to be seen with a subset having transitioned to adult services, and others whose problems had resolved whilst waiting. The only criticism of the telephone clinic itself was that a subset of parents reported feeling unprepared and unsure of what to expect from a phone consultation.

Discussion

Virtual clinics, involving Consultants and a paediatric CNS were successfully introduced for new paediatric patients waiting greater than 36 months. They led to a significant reduction in face to face appointments with resultant shortening of waiting list for those who still needed to be seen. They were associated with a high level of parental satisfaction with the service.

However, there is room for improvement to help parents feel more prepared. This could be done by providing information on the purpose and structure of the consultation in advance and offering parents a choice of dates and times in which they will be contacted. While long waiting times are undesirable and unacceptable, especially so in paediatric populations, this service may be an option as we try to ensure that children are seen in a timelier manner. It is important noting that this service was utilized for those waiting longer than 36 months. Therefore, it is difficult to extrapolate results for those waiting a shorter period of time. Further studies would be useful in assessing virtual clinic use in these cohorts as a mean of further reducing unnecessary clinic attendances.

This report highlights areas for improvement that may help shape virtual clinic service, for example the role of the CNS working alongside the consultant as a potential model for telephone consultation.

Moreover, with current government guidelines requesting the population to minimize their social interactions, virtual clinics are a way of continuing to meet the needs of our patients whilst maintaining their safety during this COVID-19 Pandemic.

Declaration of Conflicts of Interest:
The authors have no conflicts of interest to report.

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Decline in Pigmented Lesion Referrals and Melanoma Diagnoses During COVID-19 Lockdown

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Abstract

Aims

To assess the impact of COVID-19 lockdown on pigmented lesion referrals and melanoma diagnoses in our institution.

Methods

Data on NCCP pigmented lesion e-referrals and melanoma diagnoses in a single dermatology centre in 2020 were compared with 2019.

Results

E-referrals received were lowest in April 2020 (17 compared with 76 in April 2019). Melanoma diagnoses in Q2 2020 (n=15) were two-thirds lower than in Q2 2019 (n=45). Clinical stage 1 melanomas diagnosed in 2020 (n=44) were 41% lower than in 2019 (n=74). Clinical stage 2 melanomas increased from 3 in Q2 2020 to 16 in Q3 2020, which is double the number in Q3 2019 (n=8). Total number of cutaneous melanoma diagnoses were 18% lower in 2020 compared with 2019.

Discussion

Pigmented lesion referrals and melanoma diagnoses significantly reduced during lockdown with a trend for increased clinical stage 2 melanomas in later months of 2020. It will be several months before the true impact of COVID-19 on melanoma diagnoses is known.

Introduction

In 2014, Ireland's National Cancer Control Programme (NCCP) introduced an e-referral form for general practitioners (GPs) to refer suspicious pigmented lesions to dermatology and plastic surgery departments[1]. Uptake of this form is not universal amongst GPs, accounting for less than half of all referrals relating to suspicious pigmented lesions received in our institution. Reliable referral data is only recorded for referrals received electronically and numbers of NCCP pigmented lesion e-referrals have been increasing in our unit, with mean monthly e-referrals rising from 53 in 2018 to 73 in 2019.

Across specialties, cancer referrals reduced in the initial stages of COVID-19 pandemic, with reduced urgent skin cancer referrals and skin cancer diagnoses recorded in the United Kingdom[2]. This raises concerns regarding diagnostic delay and potentially poorer prognosis at the time of diagnosis[3,4]. We reviewed NCCP pigmented lesion e-referrals and melanoma diagnoses in our institution to assess the impact of COVID-19 restrictions.

Methods

This was a retrospective review of NCCP pigmented lesion e-referrals and melanoma diagnoses in our institution in 2020, compared with 2019. Data on Breslow thickness and clinical staging of melanomas diagnosed in 2020 were compared with 2019.

Results

The number of NCCP pigmented lesion e-referrals received decreased in March 2020 (containment phase of COVID-19 pandemic, when initial lockdown commenced in Ireland); n=30 compared with n=68 in March 2019. A further reduction in e-referrals was observed in April 2020 (mitigation phase); n=17 compared with n=76 in April 2019 (Figure 1). We identified that the period with lowest e-referrals (March–April 2020) coincided with a peak of 14-day incidence rate of COVID-19 at the beginning of the pandemic[5]. Referrals increased sharply as restrictions were lifted with numbers in July 2020 (n=105) surpassing referrals in July 2019 (n=85). The number of e-referrals per month in fourth quarter of 2020 are higher than corresponding months in 2019 despite the tightened movement restrictions imposed in October 2020.

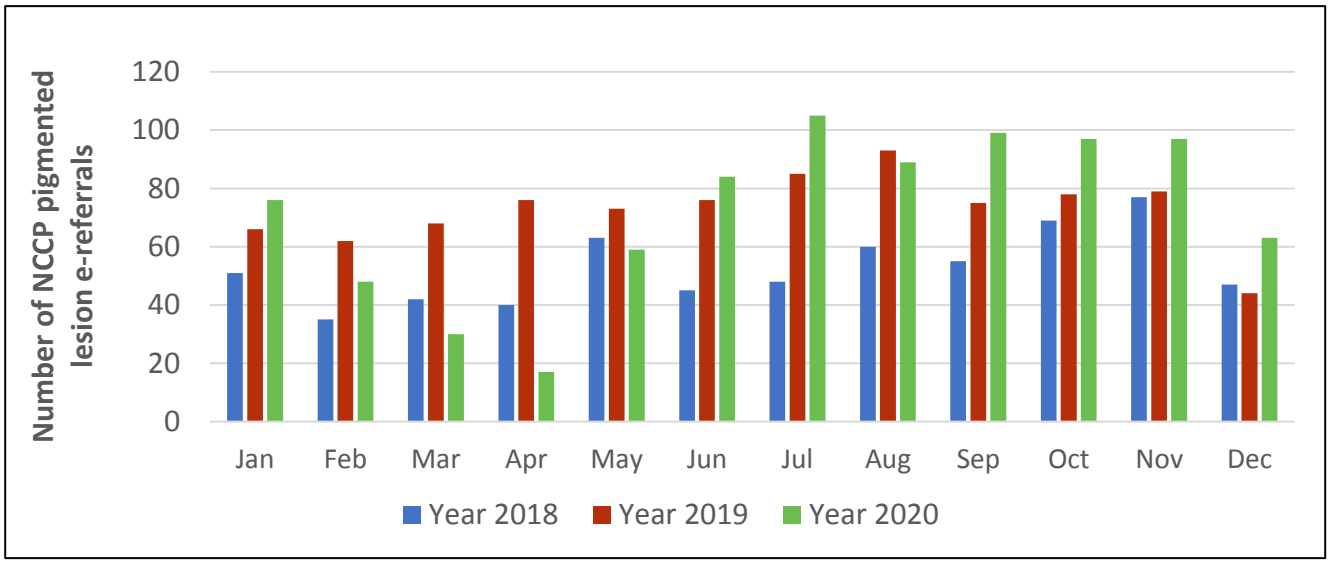

***Figure 1**: NCCP Pigmented Lesion GP e-referrals to SVUH from January to December in 2018-2020.*

The number of new melanoma diagnoses in second quarter of 2020 (n=15) was two-thirds lower than same period in 2019 (n=45), reflecting the decline in NCCP pigmented lesion e-referrals during initial lockdown and patient reluctance to attend both GP and hospital appointments. The number of melanoma diagnoses increased from third quarter of 2020 (n=41) to fourth quarter of 2020 (n= 49), comparable with melanoma diagnoses in fourth quarter in 2019 (n=50). The total number of primary cutaneous melanomas diagnosed in 2020 was 18% lower than in 2019.

Given the small numbers of patients, it is difficult to look at differences in Breslow thickness over the review period. The monthly mean Breslow thickness from 2019 to date was highest in April 2020 (3.6 mm), despite having the lowest e-referrals. This possibly reflects that only those with highly concerning skin lesions were happy to attend medical appointments during the early stage of the Covid pandemic. The median Breslow thickness were 1.3mm (range 0.4 -8mm) in first quarter of 2020, 1.7mm (range 0.4 -8mm) in second quarter 2020, 2.6mm (range 0.3 -9.5mm) in third quarter of 2020 and 0.95mm (range 0.1 -15mm) in fourth quarter of 2020.

The number of clinical stage 1 melanoma diagnoses reduced from first to second quarter of 2020 then increased from third to fourth quarter of 2020 (n=13 in January–March, n=5 in April–June, n=8 in July–September, and n=18 in October-December 2020); these figures are lower compared with corresponding periods in 2019 (n=22 in January–March, n=14 in April–June and n=15 in July–September, and n=23 in October-December 2019). The total number of stage 1 melanomas in 2020 (n=44) have reduced by 41% compared with 2019 (n=74).

The number of clinical stage 2 melanoma diagnoses reduced from first to second quarter of 2020 (n=9 in January–March, n=3 in April–June 2020). This markedly increased in third quarter of 2020 (n=16 in July–September 2020); although the overall numbers are low, this is twice the number of stage 2 melanomas diagnosed at presentation in same period of 2019 (n= 8). However, the total number of stage 2 melanomas in 2020 (n=34) were similar to 2019 (n=36).

Discussion

Almost 1200 cases of invasive melanoma are diagnosed annually in Ireland[6], with 186 cases of primary melanoma diagnosed in our institution in 2019. Breslow thickness is the most important histopathological feature when assessing melanoma staging and prognosis. We identified a reduction in NCCP pigmented lesion e-referrals and new melanoma diagnoses in our institution during the initial COVID-19 lockdown, reflecting the decline in pigmented lesion e-referrals reported nationally in the same period[7]. The numbers we report are low, but it is concerning that there is a trend towards greater proportion of melanomas in the stage 2 category at diagnosis in third quarter of 2020 compared with corresponding period in 2019. Hybrid melanoma multidisciplinary team (MDT) meetings have been held in our hospital since March 2020 to ensure continued MDT input for management for melanoma patients. The potential impact of COVID-19 on delayed presentation of melanoma and other skin cancers will not be clear for some time. We would like to highlight the importance of patients presenting with skin lesions they are concerned about so that appropriate care is not delayed.

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Declaration of Conflicts of Interest:
None declared.

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An Analysis of E-Scooter Related Trauma

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Abstract

Aim

Electronic (E)-scooters are growing in popularity on Irish roads. Research in other countries has highlighted the impact of e-scooter related injuries. The purpose of this report was to analyse e-scooter related trauma presenting to our suburban hospital.

Methods

Retrospective data analysis was performed. 22 patients with e-scooter related injuries were identified between October 2019 and November 2020. Medical records were reviewed, and Injury Severity Score (ISS) calculated.

Results

All patients had at least one radiological investigation. 68% (n=15) sustained radiologically confirmed fractures and 36% (n=8) required surgical intervention. The mean ISS score was 9.3 (59%) (n=13) of patients required outpatient follow-up and 73% (n=16) attended physiotherapy. The mean driver age was 38.2 while 60% (n=12) of drivers were not wearing a helmet.

Conclusion

E-scooter trauma results in a high rate of orthopaedic injuries, which frequently require surgical intervention. The impact on our health system as they grow in popularity may be significant. Addressing the safety concerns regarding these vehicles now may prevent serious injury.

Introduction

Electronic or e-scooters are becoming increasingly popular on Irish roads. According to the Irish Road Safety Authority, e-scooters fall under the umbrella of 'Mechanically Propelled Vehicles'[1]. They are therefore technically subject by law to rules such as helmet use and licensing requirements.

While there is no legal speed limit in place, many of these vehicles can reach speeds of over 25km/hr[2].

Studies in the United States [3], Germany [4], Austria [5], and New Zealand [6] have highlighted the impact of e-scooter related trauma. High speed, low fall height and short reaction time, in combination with a lack of personal protective equipment, means users are particularly vulnerable to upper extremity and head injuries[7]. Significant costs are associated with these injuries [6, 8] and a high percentage of patients require radiological imaging [9], admission and orthopaedic intervention [8].

Anecdotally, it was noted that a new cohort of patients with e-scooter related injuries were being treated at our facility. The aim of this report was to analyse e-scooter related trauma at our hospital.

This is the first study on e-scooter related trauma in the Irish cohort.

Methods

This report took place at a 280-bed level 3 facility suburban hospital in Dublin. Retrospective data analysis was performed. Patients were identified by searching our electronic database for presentations coded as including “scooter” or “e-scooter”.

45 patients were identified in the period October 2019- November 2020. Patients under the age of 16 (n=1) were excluded as our hospital does not provide paediatric trauma services. A further 22 patients were excluded as the vehicle involved was not an e-scooter.

Medical records, radiology and operative notes were reviewed, and all patients were contacted by phone. Injury severity score (ISS), a validated trauma scoring system [10], was calculated for all patients.

Results

Injury and Clinical Outcomes

100% (n=22) had at least one radiological investigation. 95% (n=19) underwent Xray and 27% (n=6) had a CT scan. One third (n=2) of these CT scans were CT Brains.

68% (n=15) of patients sustained radiologically confirmed fracture. Figure 1 (Next page) outlines the documented orthopaedic diagnoses for these patients.

The ISS range was 1- 34 with a mean of 9.3 and a median of 9.

Injury	Surgical Intervention
Open Comminuted Distal Tibia Fibula Fracture	1 Application External Fixation Device 2 ORIF and Retention External Fixation Device 3 2nd Stage ORIF
Bimalleolar Ankle Fracture with Syndesmosis Injury	ORIF Ankle and Syndesmosis Repair
Weber B Ankle Fracture with Syndesmosis Injury	1 ORIF Ankle 2 Syndesmosis and Deltoid Ligament Repair
Middle Phalanx Fracture Index Finger	Nil
Middle Phalanx Fracture Little Finger- Intra articular	Manipulation Under Anaesthesia and K Wire Insertion
Scaphoid Fracture	Nil
Scaphoid Fracture	Nil
Comminuted Intra-Articular Distal Radius Fracture	Open Reduction Internal Fixation (ORIF) Distal Radius
Bilateral Radial Head Fracture	Nil
Radial Head Fracture, Bilateral Distal Radius Fracture	ORIF Distal Radius
Radial Head Fracture	Nil
Surgical Neck of Humerus Fracture	Nil
Greater Tuberosity of Humerus Fracture	Nil
Completely Displaced Clavicle Fracture with Pneumothorax	1 Pleurodesis at specialist facility 2 ORIF Clavicle
Complex Facial Bone, Orbital Wall and Maxilla Fractures	Maxillofacial surgical intervention at specialty facility

Figure 1: *Orthopaedic Injury and Surgical Intervention.*

64% (n=14) of patients were discharged from the emergency department after initial investigation and management. 36% (n=8) of patients were admitted to hospital for surgical intervention, with 14% (n=3) requiring more than one surgical procedure (Figure 1).

The length of admission measured per overnight stay ranged from 1-14 nights, with a mean of 3.9.

59% (n=13) of patients were followed up at an outpatient clinic, while 73% (n=16) of patients attended outpatient physiotherapy.

Demographics, helmet usage and driving experience

91% (n=20) of the group were e-scooter drivers while 9% (n=2) were pedestrians struck by an e-scooter. 45% (n=9) of drivers were commuting with the remaining 55% (n=11) using the vehicle for recreation. The mean driver age was 38.2 years old, with a range of 17-56. 73% (n=16) of drivers were male.

40% (n=8) of drivers were wearing a helmet at the time of injury while 45%(n=9) held a full driver's licence.

25% (n=5) of patients reported having under one week of e-scooter driving experience, and 60% (n=12) reported having under 6 months experience.

Discussion

E-scooter use is likely to continue to grow in Ireland. This report demonstrates that e-scooters are used by a wide range of age groups and are used as a mode of commute, not just for recreation.

The majority of patients sustained at least one fracture and the proportion which ultimately required surgical fixation was very high at over one third of the study group. It was also noted that the documented orthopaedic injuries were complex, with one patient sustaining an open tibial fracture. Most patients required both outpatient follow up and physiotherapy. Further research may be helpful in assessing the cost of these presentations to the healthcare system as well as the cost to patients in terms of morbidity and work absence.

Compliance with personal protective use is poor with less than half of drivers were wearing a helmet. This may provide support for calls to address the safety concerns surrounding these vehicles, including the enforcement of rules regarding helmets and the introduction of speed limits. Given the high number of upper limb injuries, in particular radial head fractures, other protective equipment such as elbow protectors may have a role to play. It is important to note that these vehicles produce minimal noise and users should be encouraged to make themselves as visible as possible with reflective clothing and lighting.

This report is limited given the relatively small numbers involved. However, given the size of our hospital, these numbers still have an important impact on our facility. Higher numbers may be presenting to larger inner-city hospitals. It is also likely that these numbers will increase as e-scooter usage becomes more widespread.

In conclusion, e-scooter trauma results in a high rate of complex orthopaedic injuries, many of which require surgical intervention. The impact on our health system as e-scooters grow in popularity may be significant and further research is needed to assess their cost burden. Addressing the safety concerns regarding these vehicles now may prevent serious injury in the Irish cohort.

Declaration of Conflicts of Interest:
The authors have no conflicts of interest to declare.

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Myelin Oligodendrocyte Glycoprotein (MOG) Antibody Related Disease

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Abstract

Presentation

A 20 year old male presented with bilateral leg weakness and urinary retention.

Diagnosis

Routine bloods and imaging were normal. MRI spine showed myelitis. CSF analysis showed elevated protein and significant leukocytosis. Microbiological, autoimmune and paraneoplastic tests were negative. Autoimmune antibody testing was positive for Anti MOG antibodies.

Treatment

Initially he was treated for a broad differential with empiric CNS bacterial and viral coverage, as well as steroids. In addition to his steroid treatment, he required plasma exchange.

Discussion

MOG antibody related disease is a rare neuro-inflammatory condition. Acute treatment consists of high dose steroids, and potentially plasma exchange. There is a moderate relapse risk. Patients can be left with significant disability.

Introduction

Myelin oligodendrocyte glycoprotein (MOG) antibody related disease is a rare neuro-inflammatory condition, emerging from neuromyelitis optica spectrum disorder (NMOSD). [1] Acute treatment consists of high dose steroids, and if improvement is not seen, plasma exchange (PLEX) is used. [2]

Case Report

A 20 year old male presented to the emergency department with a three day history of bilateral leg weakness, hypoesthesia and urinary retention requiring catheterisation. He had no past medical conditions, nor regular medications. Examination revealed grade 3/5 pyramidal weakness in the lower limbs, pinprick and cold temperature sensory loss to level T5/6. Deep tendon reflexes were depressed. There was no ankle clonus. Babinskis sign was negative. Cranial nerves, cerebellar and upper limb examinations were normal.

Routine blood tests, CXR and MRI brain were normal. MRI spine revealed a longitudinally extensive T2 hyperintense anterior cord lesion from the level of C6-7 to the conus. There was no cord expansion nor abnormal enhancement on postcontrast sequences. Initial cerebrospinal fluid (CSF) analysis showed a significant leukocytosis c. 300 WBCs per mm^3 (20% polymorphs / 80% monocytes) and elevated protein (86mg/dl). CSF glucose was normal. Oligoclonal bands were negative. He underwent extensive CSF and serum testing, see table 1.

Table 1: *Tests and results.*

	Tests	**Result**
CSF Microbiology testing	Gram stain and culture, Cryptococcal Antigen Assay, Acid Fast Bacilli direct microscopy, GeneXpert MTB/RIF Ultra assay, TB cultures, PCR Meningococcal DNA, PCR Pneumococcal DNA, and PCR H. Influenza DNA	Negative
Serum microbiology tests	Borrelia Burgdorferi IgG Syphilis TP assay, Cryptococcal antigen, Lyme IgG serology, Mycoplasma pneumonia IgM, Mycobacterium tuberculosis complex DNA, Hepatitis B Surface Antigen, Hepatitis C Antibody, and HIV Ag/Ab Combo.	Negative
Serum autoimmune tests	Immunofluorescence screen, Serum ACE, MAG antibodies, Anti-Hu antibodies, Anti-Ri antibodies, Anti-YO antibodies and Aquaporin 4 antibodies.	Negative
	anti-MOG antibodies	Positive

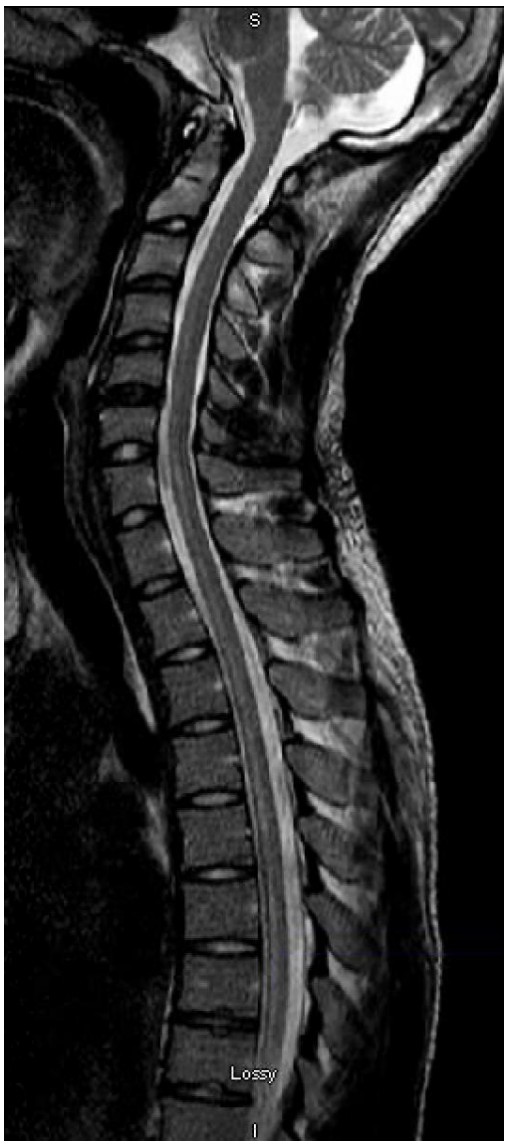

Figure 1: Sagittal T2-weighted image of the spine demonstrating irregular T2 hyperintensity in the spinal cord from the level of C6-7 to the conus.

Initially he was treated for both infective and inflammatory causes with empiric CNS bacterial and viral coverage, as well as daily 1g intravenous (IV) Methylprednisolone. Antibiotics were rationalised with microbiology results. He completed 5 days of IV Methylprednisolone, with subsequent oral steroid taper. Recovery was slow and significant residual symptoms remained; therefore, he underwent five cycles of PLEX. After this he made significant clinical improvements. He was discharged independently mobile on maintenance steroids.

The results of specialised tests sent to Oxford, England, became available after discharge. He was positive for anti-MOG antibodies. The reference range for the Oxford test was negative at 1:20 titre. The patient was informed of these results during the COVID-19 pandemic. He returned to his home country to be with his family and attends a neurologist and urologist there. He is currently well on maintenance steroids of 20mg. He has not commenced long term steroid sparing immunotherapy to date. He has ongoing neurogenic bladder issues.

Discussion

MOG antibody disease has emerged from neuromyelitis optica spectrum disorder (NMOSD).[3] NMOSD, once considered a variant of multiple sclerosis (MS), was reclassified as its own entity after the discovery of AQP4 antibody (Ab) in the pathogenesis process. NMOSD is classified on AQP4 Ab negativity or positivity.[3] There are six core clinical characteristics: longitudinally extensive transverse myelitis (LETM), optic neuritis, area postrema syndrome, symptomatic brainstem, diencephalic, or cerebral syndromes.[3] LETM is the most specific presentation. LETM is characterised by longitudinally extensive transverse myelitis lesions and spinal cord atrophy. This occurs across more than three contiguous segments of cord and is usually centrally located, with conus involement.[4,6] MRI findings help differentiate it from MS. In comparison, MS spinal cord MRI findings show lesions that are predominately in the peripheral cord and span less than three complete vertebral segments. There is also diffuse, indistinct signal change on T2-weighted sequences with MS. [6] A sensory level and bladder involvement help distinguish it from other causes of rapidly evolving weakness e.g. Guillain–Barré syndrome. In comparison to MS, NMOSD is negative for oligoclonal bands on CSF analysis.

In 2012, another antibody target, MOG, was identified in approximately 40% of AQP4 Ab negative NMOSD patients.[3] MOG is expressed on the surface of oligodendrocytes and myelin. [2] MOG helps repair the myelin sheath. Compared to AQP4 Ab disease, MOG Ab disease has some distinctive characteristics.[3] More patients may have monophasic disease with a transient presence of antibodies. The more frequent presentation in adults is bilateral simultaneous optic neuritis. [1,4,5] The most frequent presentation in under 7 years is acute disseminated encephalomyelitis (ADEM).[5]

Acute treatment involves high dose steroids; 1g of IV methylprednisolone daily for 5 days, with oral prednisolone continued for 3-12 months.[2,3] If improvement is not seen within days of acute treatment, 5 cycles of PLEX should be carried out. PLEX therapy increases remission rates. If MOG antibodies become undetectable at 6months, long-term immunosuppression is not always required.

MOG antibody disease has a risk of relapse risk; 20-74%.[1,6] Immunosuppression longer than 3 months has a lower risk of a second relapse.[7] PLEX is first line treatment for relapses.[2] Azathioprine, mycophenolate mofetil and rituximab have all been used in relapse attacks.[7]

Transverse myelitis is a predictor of long-term disability.[1] Motor outcomes after myelitis are better, however patients can be left with significant dysfunction, e.g. permanent bladder issues, bowel dysfunction, and erectile dysfunction.[1,3]

Declaration of Conflicts of Interest:
The authors have no conflicts of interest to declare.

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Hypospadias and Cocaine Use in Pregnancy

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Abstract

Presentation

Male dichorionic-diamniotic twins were born by caesarean section. Hypospadias was noted in the delivery suite. Whilst in the delivery room the father presented hyper-alert, energetic and was talkative with a short attention span raising the suspicion that he was under the influence of an illicit substance.

Diagnosis

First pass urine samples for toxicology was requested and both twins tested positive for cocaine metabolites in their urine.

Treatment

In-hospital monitoring for scoring (Finnegan score) and signs of withdrawal for a period of 5 days. Both infants were referred to Paediatric Urology with a view to planned surgery sometime after their first birthday.

Discussion

Hypospadias is a common congenital anomaly. As the use of cocaine is increasing over time there may be an under recognition of this association and a missed opportunity to correctly identify a cause.

Introduction

Hypospadias has an estimated incidence of 3- 8/1000 newborn males in Europe.[1] Studies have shown that a positive family history of hypospadias increases the risk almost tenfold. Low birth weight, small-for-gestational-age and intra-uterine growth restriction have all been associated with hypospadias.[1,2] Twins are at an increased risk and monochorionic twins are four-fold more likely to have hypospadias when compared with dichorionic twins.[1,3]

It has been hypothesised that low birth weight may reflect placental insufficiency which accounts for the increased occurrence of hypospadias in twins and for the association with pre-eclampsia.[4] A prospective cohort study found that of 50 cocaine-exposed infants, seven had a malformation of the genitourinary tract, including two with hypospadias. [5] 'Population studies from the Centers for Disease Control' in Atlanta estimate the crude odds ratio for renal tract abnormalities in association with maternal cocaine use to be as high as 4.39.[6] The prevalence of antenatal drug misuse at the Rotunda Hospital, Dublin in 1997 was nearly 3% and postnatally almost 6%.[7]

Case Report

Male dichorionic-diamniotic twins were born by caesarean section to a 31-year-old lady, G4P3, with history of 3 previous caesarean sections. She had an uncomplicated pregnancy, with no significant medical history and normal anomaly scan. She presented in premature labour at 36+1 weeks gestation.

Birth weight for twin 1 was 2.88kg. Apgars were 7 and 8 at 1 and 5 mins respectively. Birth weight for twin 2 was 2.17kg. Apgars were 5 and 8 at 1 and 5 mins respectively. Both twins had hypospadias and signs of respiratory distress, requiring non-invasive respiratory support mandating admission to the neonatal unit.

Whilst in the delivery the father presented hyper-alert, energetic and was talkative with a short attention span raising the suspicion that he was under the influence of an illicit substance. Both twins had normal full blood counts and blood cultures. Chest x-rays performed due to respiratory distress were consistent with transient tachypnoea of the newborn. First pass urine samples for toxicology were requested due to the father's behaviour and both tested positive for cocaine metabolites in their urine. Both infants were referred to Paediatric Urology with a view to planned surgery sometime after their first birthday. In-hospital monitoring for scoring (Finnegan score) and signs of withdrawal for a period of 5 days, a Medical Social Work review and risk assessment was performed with community follow-up. They were reviewed in the Neonatal Outpatient Department at 6 weeks and 3 months. They were thriving along centiles and developmentally appropriate and discharged to the care of their General Practitioner.

Discussion

There is a paucity of reporting regarding the associations between cocaine use during pregnancy and urogenital anomalies, in particular hypospadias. Testing can be performed on urine, blood, meconium, hair or umbilical cord blood.[8] False negative results are common in urine testing when there is a delay in obtaining samples as drugs clear from urine rapidly. Self-reported cocaine use will underestimate users. Approximately 5-10% of women admit to illicit drug use during pregnancy while universal testing in high risk populations confirms cocaine use in 10-40%, with drug users seldom confining their use to just one substance.[8] Cocaine use has been rising steadily over the last decade.[9] The clinician should have a low threshold for testing the urine of an infant where there is concern about drug use, both to confirm clinical concern and to ensure a psychosocial assessment and referral to social services is made. A guideline for screening is helpful to minimise bias.[10] In the case of anomalies related to illicit drug use, it is incumbent on the medical practitioner to counsel the parents of the association between their drug use and the clinical findings in the hope of preventing drug use and modifying behaviour in subsequent pregnancies.

Declaration of Conflicts of Interest:
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Patients with Covid-19 at the End of Life

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Abstract

Introduction

Management of Covid-19 has been among the biggest challenges in our medical careers. Unfortunately, it has led to a rapid end of life for some. Our aim was to describe symptomatology and medication requirements at the End of Life for patients with COVID-19 and explore the value of education, with Specialist Palliative Medical availability around the clock for all medical staff.

Case 1

A male patient with End Stage Kidney Disease (ESKD) and COVID-19 deteriorated rapidly on day 8 of his illness. The main symptoms were dyspnea and agitation.

Case 2

A male patient with ESKD and COVID-19 had progressive dyspnea over the first 5 days of his illness and his symptoms later escalated rapidly over a period of hours.

Case 3

A female patient with multiple co-morbidities who developed COVID-19 and initially appeared to be recovering well later deteriorated rapidly, over hours, on day 16 of her illness. Her main symptoms were dyspnea and agitation.

Outcome

Patients with Covid-19 experienced rapidly escalating dyspnoea and agitation in the End of Life phase, with respiratory secretions being less prominent in this cohort. Medication requirements to achieve symptom control varied considerably.

Discussion

Major obstacles encountered were the need for strict isolation with Personal Protective Equipment (PPE) for staff and family, and restricted visiting to reduce external exposure to Covid-19. Prior End of Life care education delivered to medical staff focusing on symptom management and medications, may have positively influenced early symptom assessment, proactive initiation of appropriate medications and methods of medication delivery. The availability of around the clock Specialist Palliative Medical advice may have helped other Medical staff cope with this new illness for patients in the dying phase.

Introduction

Similar to cohorts described in recent literature,[1-3] patients dying from Covid-19 infection can deteriorate rapidly, within hours, with escalating oxygen (O_2) requirements and symptoms. We describe the clinical course of the dying phase of three patients referred to a Hospital Specialist Palliative Care Service (HSPCS) within a tertiary referral centre, outlining the heterogeneity within the cohort and the importance of vigilant monitoring for escalating symptoms at End of Life. Patient assessment and advice regarding symptom management occurred via phone consultation by the Covid-19 medical team with the Hospital Specialist Palliative Care Service, around-the-clock.

We performed a retrospective observational analysis of clinical notes of three patients with Covid-19 referred to Hospital Specialist Palliative Care Service for End of Life care. Data was collected using a proforma, extracting information regarding symptoms and associated medications prescribed for symptom management in the last forty-eight hours of life. Verbal consent for inclusion was obtained from the patients' next-of-kin. A waiver was granted from the Clinical Research Ethics Committee.

Patient characteristics are outlined in Table 1. All patients were opioid naive.

Table 1: Patient Characteristics.

	Patient 1	**Patient 2**	**Patient 3**
Age	79	69	86
Sex	Male	Male	Female
Comorbidities	8	6	4
Rockwood Frailty Score	7	6	4
Days from initial illness[a] to referral to HSPCS	9	5	22
Time of Referral to death (hours)	24	27	72

a Initial onset of COVID-19 symptoms (e.g. cough, dyspnea, fever) or initial positive swab if symptom onset unknown

Case 1

A male in his seventies with End Stage Kidney Disease (ESKD) and multiple co-morbidities was admitted to hospital 5 days after a positive Covid-19 swab. He acutely deteriorated on day 8 of his illness with acute dyspnoea, associated anxiety and agitation. The previous day he had been relatively well and mobilising around his isolation room. Symptoms rapidly escalated over short hours with increased work of breathing, use of accessory muscles and pursed lip breathing/tripod positioning. A stat dose of morphine sulphate 5mg subcutaneously (SC) was administered for dyspnoea management. A trial of intravenous (IV) steroids, antibiotics and diuretics were also initiated. Despite this, imaging confirmed worsening pulmonary infiltrates secondary to Covid-19. The patient required morphine sulphate 20mg as required (PRN) SC for dyspnoea and midazolam 15mg PRN SC for agitation in the 24 hours prior to referral to the Hospital Specialist Palliative Care Service.

On Day 9, he was referred to the Hospital Specialist Palliative Care Service and a 24-hour continuous subcutaneous infusion with alfentanil 1000mcg and midazolam 10mg was commenced (Table 2).

He required a further midazolam 10mg PRN SC for agitation and morphine sulphate 12.5mg PRN SC for dyspnoea and died peacefully on day 10, well symptom controlled with his wife at his bedside in full Personal Protective Equipment (PPE). Respiratory secretions had minimal contribution to symptom burden observed. (Table 3).

Table 2: *CSCI medications/24hours at time of death.*

	Patient 1	**Patient 2**	**Patient 3**
Alfentanil	1000mcg	1000mcg	
Morphine Sulphate	-	-	40mg
Midazolam	10mg	15mg	40mg
Levomepromazine	-	-	50mg
Hyoscine Butylbromide	-	-	120mg

Table 3: *Medication requirements in the last 48 hours of life.*

	Morphine Sulphate*	**Midazolam**	**Levomepromazine**	**Hyoscine Butylbromide**	**Glycopyrronium Bromide**	**Hyoscine Hydrobromide**
Patient 1						
PRN[b]	25mg	12.5mg	-	-	400mcg	-
Total[c]	40mg	22.5mg	-	-	400mcg	-
Patient 2						
PRN	12.5mg	17.5mg	-	-	-	-
Total	35mg	40mg	-	-	-	-
Patient 3						
PRN	42.5mg	55mg	43.75mg	20mg	-	600mcg
Total	102.5mg	120mg	93.75mg	260mg	-	600mcg
Mean	59.16mg (35mg - 102.5mg)	60.83mg (22.5mg - 120mg)				

b PRN - total PRN dose in last 48 hours

c Total - total dose requirement in last 48 hours including PRN and CSCI delivered medication

** Morphine sulphate or equivalent morphine sulphate dose if alternative opioid used*

Case 2

A male in his sixties with dialysis-dependent ESKD secondary to scleroderma and significant ischaemic heart disease (IHD) was hospitalised with a cough and pyrexia. The admission Covid-19 swab was positive. He was initially treated with IV antibiotics and oral (PO) steroids. Immunosuppressant agents for the management of his scleroderma were held during this infective episode. He became progressively tachypnoeic (respiratory rate rising from 22 to 28 per minute), restless and anxious over the first 5 days of his illness. He developed a delirium and was noted to have a lobar consolidation on chest x-ray.

Antibiotics regime was escalated, and the primary hospital team consulted the Hospital Specialist Palliative Care Service by phone and were advised to prescribe PRN medications for management of dyspnoea, agitation and secretions. The patient deteriorated rapidly overnight, with escalating respiratory distress, requiring morphine sulphate 5mg PRN SC for dyspnoea and pain, midazolam 7.5mg PRN SC for agitation with effect. Following Hospital Specialist Palliative Care Service phone consultation, a 24-hour continuous subcutaneous infusion was commenced for symptom control on day 6 with alfentanil 500mcg and midazolam 7.5mg.

It was then considered inappropriate to continue further dialysis and a comfort care approach was instituted. The following day the 24-hour continuous subcutaneous infusion was titrated, accounting for PRN medication administered with benefit for symptom control (Table 2 and 3). Alfentanil was increased to 1000mcg and midazolam to 15mg SC over 24-hours. He died on day 7 with symptoms well controlled. His wife had visited on day 4 and his family were allowed to visit after death.

Case 3

A female in her eighties living independently despite multiple co-morbidities was admitted to hospital with progressive dyspnoea. She had been unwell for 7 days prior to admission. Her admission COVID-19 swab was positive. Initially, her condition improved and there was a plan for discharge home with increased community supports. However, on day 16 of her illness she deteriorated acutely with dyspnoea, respiratory distress and anxiety. Over 12 hours her condition deteriorated rapidly, developing a Non-ST Elevation Myocardial Infarction (NSTEMI). This resulted in chest pain and a rapidly increasing O_2 requirement. Over the next 4 days the ischaemic chest pain was treated with transdermal nitrate. However, this treatment provided ineffective pain control. Therefore, PRN SC opioids were administered with good effect. Intermittent agitation and anxiety were observed, with increasing O_2 requirements and fluctuating consciousness. On day 21 of her illness, a 24-hour continuous subcutaneous infusion was commenced by the on-call medical team. Morphine sulphate 10mg, midazolam 10mg and hyoscine butylbromide 60mg were prescribed for management of severe dyspnoea and agitation and mild respiratory secretions. The NCHDS had received education around anticipatory prescribing and symptom management at the End of Life in the weeks prior as part of "surge preparations". Two family members were granted a short visit in full PPE on compassionate grounds.

On day 22 she was referred to the Hospital Specialist Palliative Care Service for End of Life care. On review of the PRN medications required since commencement of the 24-hour continuous subcutaneous infusion which were deemed to be pharmacologically effective, the 24-hour continuous subcutaneous infusion was adjusted and a single dose of levomepromazine 25mg s/c was administered for management of severe agitation. Over the following 24 hours agitation continued to be problematic, requiring a further 24-hour continuous subcutaneous infusion adjustment (Table 2 and 3). The patient died symptom controlled on day 24.

Discussion

Dyspnoea and agitation were key symptoms encountered by the Hospital Specialist Palliative Care Service in this Covid-19 cohort at End of Life. Symptoms appeared to escalate rapidly, over the course of hours, and required careful around-the-clock monitoring to ensure adequate administration of PRN medication to maintain symptom control. Case 2 had progressive dyspnea which subsequently escalated rapidly over a period of hours. In contrast, Case 1 and 3 appeared to be improving or were relatively stable prior to their acute deterioration.

Within the last 48 hours of life these patients required a mean dose of morphine sulphate 59.16mg SC for management of dyspnoea and a mean of midazolam 60.83mg SC PRN for agitation and respiratory distress. All patients were opioid naive. Compared to End of Life care for other patient cohorts,[4] there was a noticeable absence of troublesome respiratory secretions. Very few PRN SC doses of anti-secretory medications were required.

As this was in the first wave of Covid-19, obstacles to End of Life care included the need for strict isolation with full PPE and requirement for staff to minimise contact. In all three cases, family members wearing full PPE, were allowed to visit for a short period during the End of Life phase. To overcome this essential and unfortunately inevitable difficulty for families, reassurance that their loved one is maintained comfortable became a vital focus of care. Regular communication with family members on the condition of their dying relative was given priority. To reassure families in this very difficult situation, fulfilling a promise of a comfortable dying for their relative was paramount.

It has been shown that Irish Junior Doctors are regularly carrying out tasks related to End of Life care, resulting in high levels of psychological stress.[5] Linnane et al,[5] suggests that *"Junior Doctors are potentially vulnerable to psychological distress due to lack of skills and knowledge around End of Life care, lack of support from colleagues and a lack of timely decision-making regarding goals of care."* Therefore, local preparations for the first predicted "surge" of Covid-19 cases included Non-Consultant Hospital Doctors (NCHDs) receiving education regarding the principles of End of Life care and associated medications for symptom management at End of Life. Local and national guidelines for anticipatory prescribing and provisional 24-hour continuous subcutaneous infusions for use at the End of Life were disseminated to medical and surgical hospital teams.[6] It is likely that this contributed to early prescription of PRN medications for symptom control and in some cases a 24-hour continuous subcutaneous infusion commencement prior to referral to the Hospital Specialist Palliative Care Service. As noted in recent literature,[7] Covid-19 has placed a renewed emphasis on advanced care planning (ACP). The local Covid-19 admission pro-forma included a prompt for ACP discussion and all patients in this cohort had a resuscitation status documented on admission to hospital.

Specialist Palliative Care aims to provide good Quality of Life for patients living with terminal conditions and good Quality of Dying at End of Life.[8] Introducing undergraduate medical students to *'the person, not the patient'* through education on Subjective Quality of Life was shown to be a positive experience.[9] Knowledge of patients individual Quality of Life and symptom issues by the Primary team in Oncology in a controlled clinical trial was shown to improve these same outcomes significantly.[10,11] The illness trajectory of this patient cohort with Covid-19 is such that patients are at End of Life at the time of referral to the Hospital Specialist Palliative Care Service, resulting in a short duration of the team's involvement. Therefore, the priority is effective, rapid symptom control, awareness of each individual's Quality of Dying with the capacity to respond around-the-clock to rapidly escalating symptomatology while being mindful to minimise the transmission of the virus to other vulnerable patients and staff.

Observation of the End of Life symptom clustering and its management is vital to further enhance our knowledge and preparation for the care of individual patients.[10,11] This requires on-going training of NCHDs and access to senior medical personnel in the Hospital Specialist Palliative Care Service around-the-clock. Our service has around-the-clock availability to a consultant-delivered advisory service that covers nine services. This availability did help to ensure a seamless integration of Hospital Specialist Palliative Care Service for patients in need and ameliorate staff concerns.

Declaration of Conflicts of Interest:
The authors have no conflicts of interest to declare.

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Bleep Free Protected Teaching Time: A Completed Quality Improvement Cycle

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Dear Editor,

A common method of communication in hospital is through a bleep device. It is well recognised that doctors often must interrupt patient care to answer a bleep[1], but what is not known is to what extent education and protected lunch breaks of junior doctors are interrupted by unnecessary bleeps. Quality improvement initiatives which reduce bleeps have been shown to improve quality of work life[2], and ongoing improvements are likely to improve the formal training of junior doctors with less interruptions during protected teaching time.

Our hospital introduced a hospital bleep policy, excepting clinical emergencies, citing a bleep free period of one hour from 1300 hours daily for designated lunchtime in April 2018. We undertook a quality improvement change cycle and information was disseminated across the hospital to re-iterate the timing of protected teaching time for doctors. Consultant physicians answered all bleeps during teaching periods and explained about the bleep free teaching period. In phase one (April 2018 – May 2019) we collected the baseline data. In phase two of the change cycle (June 2019 to December 2019) emails were sent to all the clinical nurse managers to remind them of the policy and they were asked to educate all of staff in their respective wards. Areas which had accounted for a high proportion of bleeps in phase one were targeted with more directed reminders, with laminated information sheets displayed in these areas to act as ongoing visual cues. We compared data pre and post.

In the first phase of this project (April 2018 – May 2019) we collected data on 24 different teaching sessions. A total of 103 bleeps were made to doctors during this time period. The median number of bleeps was 5.5, range 1 to 11. In the second phase of this project (June 2019 – December 2019) we collected data on 13 different teaching sessions. A total of 63 bleeps were made to doctors during this time period. The median number of bleeps per session was 5, range 2-7. A linear regression analysis and found that during phase 2 of the change cycle there was a statistically significant decrease over time on the average number of bleeps per teaching session (p value 0.01, R^2 47.5).

There were increases in the absolute proportion of bleeps from both the Day Wards, and general wards, but this was not statistically significant. There was a statistically significant decrease in the proportion of bleeps from the emergency department (15% vs 2.5%, p = 0.03). There was no statistically significant difference in the proportions of bleeps across different healthcare professionals, or the absolute proportion of bleeps classified as urgent.

In conclusion, we found that a combined approach of consultant colleagues answering bleeps and targeted education of hospital staff resulted in a statistically significant reduction in the absolute number and proportion of bleeps in certain targeted areas of the hospital, indicating that change is possible and achievable. We believe this will translate into improvements in the quality of post-graduate education.

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Interaction Between Sugammadex and Hormonal Contraceptives

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Dear Sir,

The approval of sugammadex in Europe in 2008 led to a paradigm shift in the reversal of aminosteroid-induced neuromuscular blockade. When compared to neostigmine, sugammadex has the ability to reverse any depth of rocuronium-induced blockade and carries a far more favorable side effect profile. Today, these characteristics have made sugammadex a commonly used muscle relaxant reversal agent.

Sugammadex has a novel mechanism of action. It acts by directly encapsulating aminosteroid neuromuscular blockers, thereby reducing free drug levels in the plasma. This creates a concentration gradient leading to drug release from the neuromuscular junction into the plasma where it is encapsulated. The end result is a reduction in the amount of drug at the neuromuscular junction.

In addition to binding aminosteroid neuromuscular blockers, sugammadex also binds endogenous compounds with a similar steroid structure, such as hormones and hormonal contraceptives.

The administration of a bolus dose of sugammadex is considered to be equivalent to missing a dose of an oral or non-oral contraceptive containing an oestrogen or progesterone (this includes oral contraceptives and any implantable devices).

To negate the potential for unwanted pregnancy and taking into account poor verbal recall post-operatively we have introduced an information leaflet for women taking oral and non-oral contraceptives. The leaflet explains that if the patient has taken a combined (pill) or progesterone only (mini pill) oral hormonal contraceptive, and has received sugammadex following surgery, it should be considered equivalent to a missed dose of contraceptive, thus it is advised to use a barrier method of contraception for 7 days. Patients using implantable hormonal contraceptives (mirena, coil, vaginal ring, injection implant etc) should use a barrier method of contraception for 7 days following administration of sugammadex post anaesthesia. In addition, we ran educational sessions for staff to highlight the potential safety risk of this interaction.

These simple interventions should address the patient safety risks posed by this interaction and lead to greater patient satisfaction.

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Audit of the Carbon Footprint of Inhalers in an Irish General Practice

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The climate crisis has been described by the Lancet as "biggest global health threat of the 21st century"[1]. There is a paradox in that the healthcare we provide may exacerbate the climate crisis; it is estimated the global healthcare has a carbon footprint that exceeds most Western countries. There is a paucity of literature showing how we can decarbonise healthcare. The most frequently employed therapeutics for respiratory are inhalers which vary in class, use and importantly carbon footprint. Multidose Inhalers (MDIs) contain hydrofluorocarbons which have a disproportionate effect on the carbon footprint of healthcare. The NHS estimates inhalers account for 3% of their entire carbon footprint and have identified inhaler prescribing as a target to achieve "net zero" by 2040. Soft Mist Inhalers (SMIs) and Dry Powder Inhalers (DPIs) do not contain hydrofluorocarbons and so have a fraction of the carbon footprint than MDIs[2]. The carbon footprint of inhalers prescribed in Ireland is not known nor is the potential carbon savings by switching to alternatives such as DPIs.

The number and type of prescribed inhalers in a mixed rural urban GP practice was determined retrospectively January – June 2020. An educational team intervention was performed aiming to switch MDIs to DPIs where appropriate, with patient counselling and consent and in line with best practice. Inhaler prescribing was re-audited July -December 2020 and the carbon equivalent difference estimated. Over the six months of the duration of the audit a potential saving of approximately 21, 448 kg of CO2 was achieved.

Targeting inhaler prescribing offers the potential to significantly improve the carbon footprint of Irish healthcare. The carbon saved by changing MDIs to DPIs and SMIs in this audit is the equivalent of driving around the globe twice or charging almost 3 million smart phones[3]. DPIs and SMIs may also improve drug delivery, improve compliance, reduce waste and reduce costs associated with unscheduled care. Targeting inhaler prescribing offers the potential to significantly improve the carbon footprint of Irish healthcare and importantly these savings will continue on into the future. Reducing the carbon costs of inhalers offers healthcare a rare triple win; better health for the patient, better health for the planet, and monetary savings from improved disease management.

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Music, Health and COVID-19

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Increased stress levels resulting from fear of COVID-19, physical distancing measures and economic problems may cause detrimental effects on mental health.[1] Music appears to have a universal salutogenetic effect, with participation in musical activities providing an effective means of alleviating stress, anxiety and depressed mood and serving as a proxy for social interaction. A nationwide Spanish survey conducted during the lockdown in April 2020 assessed the subjective experience of participants in regard to music as a means of improving psychological wellbeing.[2] The respondents reported an increase in time devoted to various musical activities and a perception that music facilitated relaxation and escape and improved mood and social wellbeing.[2] In a cross-cultural survey with over 5000 participants from Europe, India and the United States, more than half of the respondents reported using listening to and making music as an aid to coping with emotional and social stress factors during the lockdown in spring 2020.[3] Music was chiefly used to reduce loneliness and stress and as an imaginary exchange and social surrogate.[3] A 5-week pilot study from Italy examined the effectiveness of remote receptive music therapy as a support intervention to reduce stress and improve wellbeing in hospital staff assisting patients with COVID-19.[4] Following the intervention, the participants reported a significant reduction in intensity of fear, tiredness and sadness.[4] These favourable findings require confirmation. Musical activity is an easily accessible coping behaviour, which may be capable of aiding in stress management, improving emotional self-regulation, strengthening resilience and meeting social needs. The potential value of music-related behaviours in the management the current pandemic warrants more research.

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COVID-19 and Hip Fracture Management in Ireland Compared to International Standards

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Dear Sir,

COVID-19 has caused significant challenges in the provision of safe and effective healthcare globally. We examined the impact of departmental reconfigurations on hip fracture quality standards/outcomes during the first wave of the COVID-19 pandemic (March 1st – May 1st, 2020). This time period reflected the initial alterations to patient flow and redeployment of key staff members during the first COVID-19 wave.

Variables of interest included source of admission, adherence to the Irish Hip Fracture Standards (IHFS), length of stay, re-admission rates, discharge destination and 30-day mortality. All variables were compared to the same timeframe from the previous year.

There were 118 hip fracture cases during these timeframes. Sixty patients (37 females, 62%) were treated during the COVID-19 time period compared to 58 patients (40 females, 69%) during the preceding year. There was no difference between median ages (82 vs 75 years, p=0.213). More patients (23.3%) were admitted from nursing homes during the COVID-19 wave than in the comparative group (14 vs 5, 23.3% vs 8.6%, p = 0.052).

IHFS were maintained, with each standard showing an improvement from the previous time period. Admission to an acute orthopaedic ward within four hours of admission (IHFS 1) improved from 44.8% to 56.7% in the COVID-19 time period (p=0.27). Surgery within 48 hours of admission (IHFS 2) improved from 50% to 60% (p=0.37). Minimising the risk of developing pressure ulcers (IHFS 3) also improved from 3.4% to 1.7% (p=0.98). Likewise, Orthogeriatric review during admission (IHFS 4) improved from 74.1% to 80% (p=0.59), while adherence to a comprehensive bone health assessment (IHFS 5) remained high in both timeframes (96.6% vs 96.7%, p=1.0). Finally, access to a Specialist falls assessment (IHFS 6) increased from 75.9% to 95% (p=0.07) in the COVID-19 time period.

The median acute length of stay (LOS) was 7.5 days in the COVID-19 cohort compared to 10.0 days in the comparative group (p=0.345). There was a higher 30 day re-admission rate in the COVID-19 patient cohort (4 vs 1, p = 0.36), and a statistically significant increase in new nursing home admissions (4 vs 0, p=0.04). There was no statistically significant difference in either inpatient mortality (8.3% vs 5.2%, p=0.961) or 30 day mortality (10% vs 6.9%, p=0.961). Three patients (5%) tested positive for COVID-19. One patient was deemed unfit for surgery and died as an inpatient after four days. The other two positive patients underwent surgical fixation, their LOS was 26 and 31 days respectively.

Larger international studies have demonstrated increased peri-operative complications and increased mortality rates in COVID-19 positive patients with hip fractures. (1)(2) Although our case series is relatively small, it demonstrates consistent findings with a definite mortality risk and prolonged LOS.

In summary, IFHS were successfully maintained despite significant changes in practices and redeployment of staff. We noted trends towards higher re-admission and higher nursing home admission rates which warrants ongoing monitoring. However overall, our findings highlight the commitment of both the geriatric and orthopaedic departments in delivering high quality hip fracture care despite disruptions in well-established hip fracture pathways.

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Response to: 'Tocilizumab Rescue Therapy in Severe COVID-19 Pneumonia' (Ir Med J; Vol 114; No. 3; P289)

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Dear Sir,

We read with interest the data presented by Nurdin et al. on their experience with using tocilizumab as a rescue therapy in patients admitted to the intensive care unit with severe COVID-19 pneumonia. Following the results of their study the authors suggest that tocilizumab may have a role in the management of COVID-19 pneumonia. This conclusion appears to be largely based on the finding of markedly reduced C-reactive protein (CRP) serum levels as well as defervescence of fever following administration with tocilizumab.

The authors rightly conclude that, based on their data, it is difficult to attribute clinical benefit to tocilizumab use but that it may be of benefit in reducing the hyperinflammatory response. We would like to raise a word of caution about correlating a reduction in CRP levels with a positive clinical response to tocilizumab. Tocilizumab is a recombinant humanised monoclonal antibody that inhibits interleukin-6 (IL-6) from binding to its receptor (IL-6R)[1]. IL-6 is an inflammatory cytokine produced in response to infections and tissue damage and it has a key role in cytokine release syndrome (CRS). CRS is a recognised complication of COVID-19 and is associated with high mortality. Patients hospitalised with severe COVID-19 have been shown to have increased levels of IL-6, potentially attributable to CRS[2]. It is on that basis that IL-6 inhibitors are currently being used as experimental treatment options in patients with severe COVID-19.

After IL-6 is synthesized in the initial stage of inflammation, it moves through the bloodstream to the liver and induces hepatic synthesis of acute phase proteins including CRP[3]. Therefore, inhibition of IL-6 leads to a rapid reduction in CRP serum levels. Due to its mechanism of action, administration of tocilizumab in patients with COVID-19 is associated with a reduction in CRP serum levels regardless of clinical outcome and can suppress CRP response for up to three months post administration[4, 5].

In conclusion, while the study presented is interesting and further studies are warranted to evaluate the use of tocilizumab in patients with COVID-19, using CRP as an indicator of clinical efficacy is not advisable. The reason for this is that a significant drop in serum CRP levels is an expected finding following the use of tocilizumab and does not always correlate with a better outcome. Clinical parameters should be used to monitor response to treatment, such as oxygen requirements and the need for other organ supports, radiological progression, length of hospital stay and survival. A normal CRP should not be used to outrule bacterial superinfection; the use of additional biomarkers such as procalcitonin should be considered.

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