Edition: October 2021; Vol 114; No. 9

Publication Date: October 21, 2021

IMJ
Official Journal of the Irish Medical Organisation

Peri-operative and Pathologic Outcomes of Minimally Invasive Partial Nephrectomy (MIPN)

Considine et al report a series of 150 minimally invasive partial nephrectomy cases (MIPN).

In-Hospital Cardiac Arrests: A Study of Incidence and Outcomes

Gardiner et al describe 119 cases of in-hospital cardiac arrests. This is calculated at 5.1 per 1000 patients per year. The survival to discharge was 32.8%.

Covid Concerns: A Radiological Perspective

O'Reilly et al surveyed 92 radiology staff on the impact of the Covid-19 pandemic. A high proportion of respondents felt that it had a negative effect on training, patient care, and staff morale.

Cross-sectional Study of Palliative Care to Hospitalised Patients with COVID-19

Costello et al report their experience on the provision of palliative care to hospital patients with Covid-19. There were 49 patients, their main symptoms being dyspnoea, agitation, and pain. Thirty eight patients died, the median time between referral and death was 2 days.

Orthopaedic Injury Patterns Associated with Electric-Scooter Use

O'Halloran et al report 15 patients who sustained significant electric-scooter injuries. The majority were travelling at around 20 Km/hour. There was a variable use of helmets.

Research Correspondence

Responding to COVID-19 Related Mental Health Impacts Among Elite Athletes

Short Report

Significant Increased Headache Presentations to the Acute Medical Unit Coinciding With Universal Masking

O'Byrne et al describe the relationship between mask wearing and headaches. In their service the number of patients presenting with headaches increased from 113 to 329, a 2.9-fold rise.

Case Reports

[An Incidental Finding of a Lingual Thyroid Gland]

Jones et al report a case of a sublingual thyroid gland. The presentation was right facial pain and otalgia.

[Acquired Angioedema in a Child with Systemic Lupus Erythematosus]

Sokay et al describe a 15 year old girl with angioedema associated with SLE. She presented with non-pitting, painful swelling of the face, difficulty in swallowing and speaking.

Case Series

[Use of Carbon Fibre Implants in Metastatic Spinal Surgery]

Denton et al describe the technique of carbon-fibre implants for metastatic spinal lesions. It is pointed out that 70% of patients with cancer develop spinal metastases and that 10% get some degree of cord compression.

Letters To Editor

[Introduction of a Targeted Chlamydia Screening Program in a Tertiary Level Maternity]

[Forty Percent of Children Attending General Paediatric Clinics in an Irish Hospital are Overweight]

[Optimising Analgesia for Hip Fracture Patients Using Quality Improvement Methodology]

[A Survey of the Potential Acceptance of a SARS-CoV-2 Vaccine Amongst People Living with HIV]

[The Impact of Covid-19 on Medical Professionals' Benzodiazepine Prescribing Practices]

[Availability and Use of Assistive Listening Devices with Older Patients]

[Delayed Diagnosis in ANCA-associated Vasculitis Due to COVID-19 Pandemic]

Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P457

Mandatory Folic Acid Flour Fortification in the UK

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

On September 20, 2021 the UK announced the introduction of mandatory folic acid fortification of non-wholemeal wheat flour in the prevention of neural tube defects (NTDs), including spina bifida and anencephaly. Wholemeal wheat flour is exempt because it contains naturally occurring folate[1].

Thirty years ago, the Medical Research Council conducted an RCT (randomised control trial) to determine the effectiveness of folic acid supplementation in the prevention of the recurrence of NTDs[2]. It found that the group who took daily folic acid reduced the NTD risk by 70%.

Making additions to flour is not a new concept. Since the second world war, flour has been fortified with calcium, iron, niacin and thiamine during milling.

There are 1,000 neural tube defect (NTD) cases in the UK annually. It is estimated that the folic acid fortification will prevent 20% of the cases, that is 200 NTDs per year.

Folate is a water-soluble B vitamin. It is found naturally as folate in many foods such as green leafy vegetables. Folic acid derives its name from the Latin word folium which means a leaf. It was first isolated from the spinach leaf in 1941.

Folic acid cannot be made or stored by the body. It must be provided from one's daily intake. Greater amounts of folic acid are required during pregnancy because the rapid rate of cellular and tissue growth of the fetus.

Many people do not achieve the recommended daily intake. It has been estimated that 90% of women aged 16 – 49 years have a folate status less than recommended to reduce the risk of an NTD. The folate status in the UK has deteriorated in recent years. The red blood cell concentration of individuals has decreased by 5% per year between 2008-2009 and 2016-2017.

NTDs occur in the first 4 weeks of the pregnancy. Only one fifth of women report taking folic acid supplements before pregnancy. It appears that attempts to increase folic acid levels through education has had a limited effect. The other important consideration is that over half of pregnancies are unplanned.

There are reports that the folic acid intakes of women in the reproductive age group has declined particularly in deprived areas.

The relationship between folic acid and NTD risk is in part due to its role in nucleotide synthesis. The rapidly dividing cells of the developing neural tube requires the synthesis of large amounts of nucleotides in order to facilitate DNA replication. In the absence of sufficient nucleotides, cellular replication slows down, and the neural folds are impeded[3].

Folic acid fortification of flour has been adopted in more than 60 countries including Australia, Canada, and the US. Many countries have added in the region of 150ug of folic acid per 100 g of flour. This provides 100 – 200 ug of folic acid per day[4]. Following its introduction, countries have reported falls in NTD rates, ranging from 16% to 58%. The countries with the highest background prevalence have witnessed greater declines.

New Zealand authorised folic acid fortification of flour in July 2021. During a public consultation process, the majority of participants were supportive of the mandatory approach.

Kehoe et al[5] have modelled the potential impact of adding folic acid to flour in Ireland. They estimate that it would reduce NTDs by 8% to 32%. The risk of masking anaemia associated with vitamin B12 deficiency in older adults would be negligible.

Daly et al[6] have previously shown that there is a log linear association between a woman's serum folate concentration and her risk of having an NTD pregnancy.

The prevalence of NTDs has not decreased in Europe, 0.91 per 1,000 births[7]. In comparison, in the US, NTD prevalence has decreased from 0.76 per 1,000 births to 0.56 per 1,000 births following mandatory folic acid fortification of flour. In Europe it had been hoped that the NTD prevalence would fall due to improvements in diet, and the taking of folic acid supplements prior to conception.

An update report[8] on folic acid and the prevention of NTDs was published in Ireland in 2016. It is a very comprehensive document that runs to 83 pages. Ireland is considered as having a high rate of NTDs. It is stated that the current rate is 0.93 per 1,000 births, and the lowest achievable rate is 0.6-0.7 per 1,000 births.

Fifty per cent of the indigenous Irish population has variations in the gene coding for the enzyme involved in folate metabolism – 5, 10-methylenetetrahydrofolate. This genetic variation may account for 1-in-4 NTD cases in Ireland.

The report describes 2 options. The first is mandatory fortification of flour with folic acid plus the advice that all women of child-bearing age should take an additional 400ug of folic acid daily. The second option is to continue with the current policy of advising daily 400ug folic acid advice for child-bearing women and the voluntary fortification of foods. The report recommends that the policies should be reviewed on a regular basis.

The UK decision to introduce mandatory fortification of flour is likely to re-open the folic acid debate.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P458

The Importance of Interprofessional Collaboration in the Intensive Care Unit

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Although effective interprofessional collaboration (IPC) in healthcare is an important aspect of patient care in all clinical areas, interdisciplinary teamwork plays an especially pivotal role in providing optimal care to a hospital's most critically ill patients: those in the intensive care unit (ICU). In their 2004 study on IPC in the ICU, Lingard, et al. describe the unit as an intersection of various clinical areas, including emergency medicine, surgery, and palliative care.[1] As such, care for these patients is often challenging and highly complex. Various studies describe the risks of inadequate communication in this stressful setting and highlight the potential for compromising patient care and making errors due to a lack of cooperation.[2,3] In order to optimize IPC and the different aspects of patient care, every member of the multidisciplinary team should be familiar with their own responsibilities as well as those of the other team members.[4,5]

Duties of the consultant in critical care medicine include providing critical care, designing treatment plans, and assuming responsibility for the overall wellbeing of the patients in the ICU. Additionally, consultants also supervise the training of medical staff and students and discuss patient care with hospital management.[5] Nurses working in the ICU should be trained in critical care, as their responsibilities include coordinating and supporting the patients' specific treatment plans, providing constant care and support during recovery, and monitoring the patients' progress throughout their time in the ICU.[5] Furthermore, there is an increasing need of active participation from nursing staff in joint clinical settings, as the collaboration of nurses and physicians aid in providing a more holistic and comprehensive approach to patient care. This collaboration between physicians and nurses is recognized as integral in providing patient- and family-centered care plans in the critical care unit.[6]

Many critically ill patients require physiotherapy to help prevent and mitigate the adverse effects of long-term stay in the ICU. The goals of an intensive care physiotherapist include maintaining integrity of the musculoskeletal system, preventing diaphragmatic weakness due to mechanical ventilation, preventing deep vein thrombosis and pressure ulcer formation, and maintaining proper cardiovascular functioning to aid in rehabilitation.[7]

The role of the speech and language therapist (SALT) in critical care is twofold. Firstly, they are in charge of assessing a patient's ability to communicate. Secondly, they evaluate a patient's oropharyngeal patency and their ability to swallow. The SALT will help the patient in managing dysphagia and assist them if their ability to communicate is compromised.[4]

Occupational therapists facilitate rehabilitation by providing opportunities for the patient to maintain participation in activities of daily living. This may include teaching the patient new ways of taking care of themselves and their homes, as well as how to resume their jobs and hobbies. Occupational therapy can improve patient outcomes by reducing physical, emotional, and cognitive complications.[8]

Critical care pharmacists and dieticians also play an important role in the ICU setting. Pharmacists manage medications and advise on routes of drug administration, while monitoring pharmacokinetic and pharmacodynamic parameters of the treatment regimen.[9] Dieticians, on the other hand, develop strategies to meet ICU patients' nutritional requirements, including proper electrolyte and glucose control.[10]

The ultimate goal of IPC in the ICU is to provide optimal, holistic patient care by encouraging effective communication and teamwork. Furthermore, IPC can also reduce healthcare costs and improve patient outcomes by preventing oversights, medication errors, and redundant interventions.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P459

Professionalism, Pandemics and Ransomware: Coping with Challenge and Uncertainty

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The recent cyberattack on Ireland's health system has added further challenge and uncertainty to our health and social care professionals, already exhausted from their heroic efforts in the national response to the Covid-19 global pandemic.

Over the last year we have seen the Covid-19 global pandemic emerge to become the greatest health, economic and societal catastrophe of our age[1]. The human cost is truly staggering, the World Health Organisation (WHO) reporting worldwide over 175 million confirmed positive cases and 3.7 million deaths, amongst them many health and social care workers, and each and every one a tragedy[2]. We have taken great hope from the response of our health and social care professionals to this great challenge. We have witnessed compassion, duty, altruism and heroism [3]. They have confronted the unknown, placed themselves in harms-way, because it was the right thing to do; to help patients and support colleagues. They have worked long hours, learned new skills, worked online, redeployed and endured those same social restrictions. Furthermore, the collaborative effort to develop and administer effective vaccines must rank amongst modern humanities greatest achievements[4]. Health and social care professionals have truly done their duty but at enormous strain and on an already overburdened, understaffed and under-resourced healthcare system. It has exposed the great inequalities in our healthcare and in our society. Recently, hope emerged that the pandemic in Ireland was waning, whilst remaining cautious as other countries worldwide continued to struggle and concerns emerged regarding new variants. We had perhaps taken a brief moment to breathe, before we rallied again to begin the even greater challenge to rebuild services and address the enormous backlog of delayed care[5].

Then just one month ago cyber criminals used the human-operated Conti ransomware to target the IT network of Ireland's Health Service Executive (HSE) early on the morning of the 15 May 2021, with severe impact on clinical services[6]. The National Cyber Security Centre (NCSC), has said restoring the IT systems which have grown and evolved over 30 years will be a monumental task.

The Hackers, allegedly a shadowy group called Darkside, have targeted a variety of agencies worldwide for financial gain without regard for human cost. Apparently, patient records are big business, with stolen health credentials fetching upwards of 10 times the value of a credit card number[7]. Ireland's Health Service once more had to prioritise patient safety and maintain critical clinical services in a very difficult environment. Impaired access to patient records, information management systems and timely accurate diagnostic tests creates a risk to patients and service users of inadvertent clinical error, human error, delayed diagnosis, and delayed treatment. The State Claims Agency (SCA) also recognised the risk practitioners face.

Technology's role in healthcare has expanded exponentially over the last 20 years, improving the safety and quality of care, becoming essential to modern health systems and clinicians' practice. Revolutionary advances such as Electronic Health Records (EHRs), provide clinicians with immediate access to past medical history, laboratory and imaging results, and important alerts, such as allergies. Email, Mobile Health and Telemedicine have revolutionised how we connect to and access healthcare. However, that reliance on technology can bring overdependence with serious repercussions when connectivity fails or security is breached[8].

It is understandable many professionals feel they have reached the limits of their ability to cope. Resilience, oft quoted as an ability to rebound quickly from adversity, under repetitive strain has limits. Perhaps some reflection on our motivation to become and be a professional, may help. As professionals we strive to embody values, behaviours and relationships which enable our patients to trust us at their most vulnerable with their health, wellbeing and lives[9]. It is a great privilege and a great responsibility. Our professionalism has been tested to its limits and beyond. Compassion, altruism and duty; these values and behaviour underpin public trust that we shall act in their best interests, be compassionate and empower them to make the best available choices. Compassion allows us to understand another's suffering and moves us to provide relief. Despite the risks we selflessly placed ourselves at risk to help patients and support each other. As professionals we have a duty and performing one's duty may require some sacrifice of self-interest. However, ordinary morality does not normally require beneficent acts of maximum altruism, such as professional's putting their lives at risk to provide care[10]. These extreme beneficence acts are commitment well beyond duty and may be considered heroic.

The great medical educator William Osler said, "Medicine is a science of uncertainty", and most of medicine is uncertain, professionals encounter it every day. However, continual challenge and uncertainty is tough, it brings disorientation, uncertainty, insecurity and fear. It is exhausting, mentally and physically. Medicine has few occasions when we are certain, we constantly make time-limited high-stakes decisions with limited information. Epictetus, a famous Stoic Philosopher, reminds us "The chief task in life is simply this: to identify and separate matters so that I can say clearly to myself which are externals not under my control, and which have to do with the choices I actually control". Our goal should not be to eliminate uncertainty but to develop that art of making the best of the available choices. Healthcare strives for excellence in patient care but should not forget its most valuable resource is a dedicated high-quality workforce.

Health and social care professionals have endured these challenges, reciprocally, employers and professional bodies must ensure staff are supported through and beyond in respect to wellbeing, career, licensing and indemnity.

The only real certainty is neither Covid-19, nor Ransomware, will be our last challenge and we must reflect personally and organisationally upon our preparedness and resilience. We must build more resilient systems, resilient workforce and a work environment in which all can thrive.

Keywords: Professionalism, Covid-19 Pandemic, Ransomware, Resilience

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P460

Patient Opinions about Medical Student Involvement in Obstetrics and Gynaecology

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Abstract

Aim

The aim of this study is to assess patient attitudes towards medical student involvement in their Obstetric and Gynaecologic care in an Irish health care setting.

Methods

This was an observational study performed at Our Lady of Lourdes Hospital in Drogheda, Ireland that used self-administered surveys to assess patient level of comfort with students either observing or performing clinical skills in the inpatient and outpatient setting. These included observing or performing history taking, abdominal exam, vaginal exam, vaginal delivery, and observing caesarean section.

Results

A majority of the women surveyed would allow students to observe all clinical skills. Only 38 (18%) women would not allow a student to perform a vaginal exam, 53 (25%) would not allow a student to perform a vaginal delivery. Increased age appears to be a greater determinant of higher comfortability than parity.

Conclusion

Obstetrics-gynaecology patients in an Irish health care setting are willing to involve medical students in their care. The majority of the patients involved in this study were comfortable with student involvement, whether in an observational or hands-on capacity.

Introduction

To acquire the knowledge and develop the practical skills required to become a doctor, it is imperative that medical students have patient contact and hands-on clinical experience. For a large portion of medical school, the hospital is the classroom. However, it is important to consider how patients feel about medical student involvement; both to ensure patients feel comfortable and satisfied with their care, and to ensure medical students have adequate clinical exposure. This balance is particularly difficult to maintain in the specialty of Obstetrics and Gynaecology, which is sensitive by nature. A patient's level of comfort and willingness, or a physician's assumption of what a patient may allow, is often the deciding factor in whether or not a student will have a learning experience.

To date, multiple studies have been conducted to assess how patients in Obstetrics and Gynaecology feel about the presence of medical students in various clinical scenarios. In general, it appears that a majority of patients have positive attitudes towards medical students.[1, 2, 3] An American study demonstrated that patients are willing to allow medical students to be involved in their care, with a minority of patients (less than 25%) preferring to see the physician alone.[1] One study conducted in Saudi Arabia found that patients were most comfortable when students were only participating in limited clinical roles, such as history taking.[2] The same study found that the patients' comfort levels were higher with female students compared to male students.[2] Student gender was also found to be a factor in patient satisfaction in a New Zealand study, which also found that patients under the age of 40, and those receiving in-patient care, also had higher levels of satisfication.[3]

Given the lack of data available in Ireland, the purpose of this current study is to further our understanding of the attitudes of women in an Irish health care setting have towards medical students.

Methods

This was an observational study conducted at Our Lady of Lourdes Hospital (OLOH) in Drogheda, Ireland in 2020, a maternity teaching hospital with a per annum average of 3000+ births, 1400+ gynaecological admissions and 1300+ gynaecological procedures. Ethical approval for the project was obtained from the hospital research ethics committee. Questionnaires were printed and distributed to patients in both the outpatient and inpatient setting of Obstetrics and Gynaecology including the labour ward, antenatal inpatient ward, antenatal clinic, gynaecology inpatient ward, gynaecology clinic, and early pregnancy assessment unit. The questionnaire was optional, self-administered, and entirely anonymous. Consent was obtained for all patients who completed the survey. The objective of the questionnaire was to assess how comfortable Obstetrics and Gynaecology patients are with medical students being involved in their care. Basic demographics including age, reason for admission, and parity were also recorded. The survey is available as a supplementary file.

In total 230 questionnaires were collected over the course of two months from December 2019 to January 2020. Of those, 16 questionnaires were excluded due to missing age or more than three incomplete responses to rating their level of comfort. In total, 214 were satisfactorily completed. The data from these questionnaires was then recorded and the percentage of patients that selected each response to the different clinical settings was calculated. One-way ANOVA testing was used to analyse whether age or parity had a statistically significant impact on patient responses ($P<0.05$).

Results

Analysis of the 214 surveys collected in this study demonstrate that the majority of patients are comfortable with students observing a physician during all clinical scenarios presented in the questionnaire: history taking, abdominal exam, vaginal exam, vaginal delivery, and caesarean section (Figure 1). With respect to students performing tasks themselves, the majority of patients were comfortable with students taking a history and performing an abdominal exam (Figure 2). Only 18% of patients reported that they would not allow a student to perform a vaginal exam, and 25% reported that they would not allow a student to perform a vaginal delivery.

When looking at patient demographics, it appears that patient age and parity had varying impacts on how comfortable they felt with students.

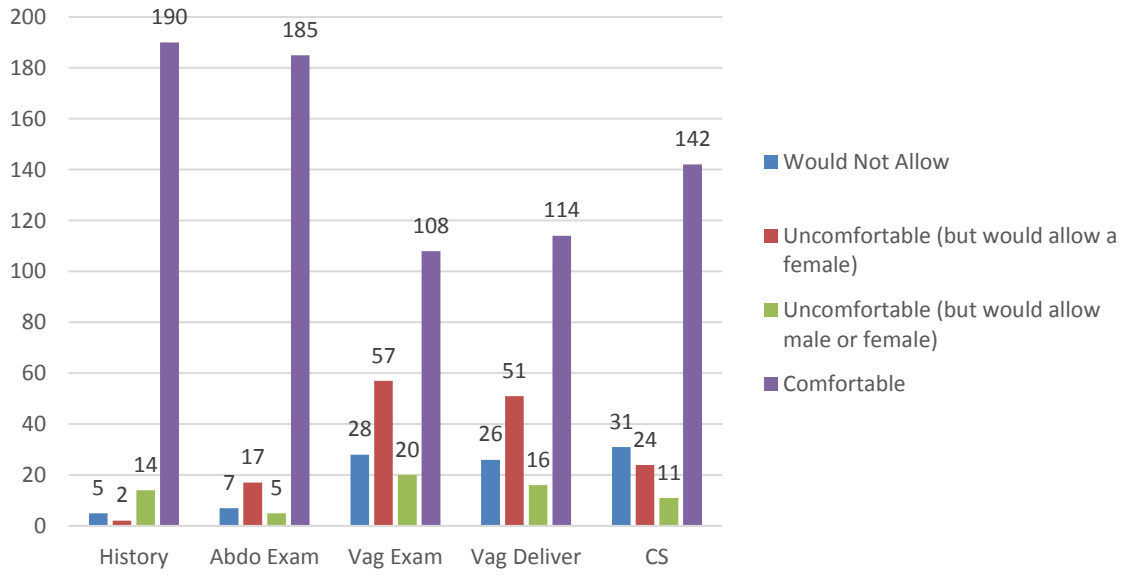

Figure 1: Patient comfort with students observing clinical tasks.

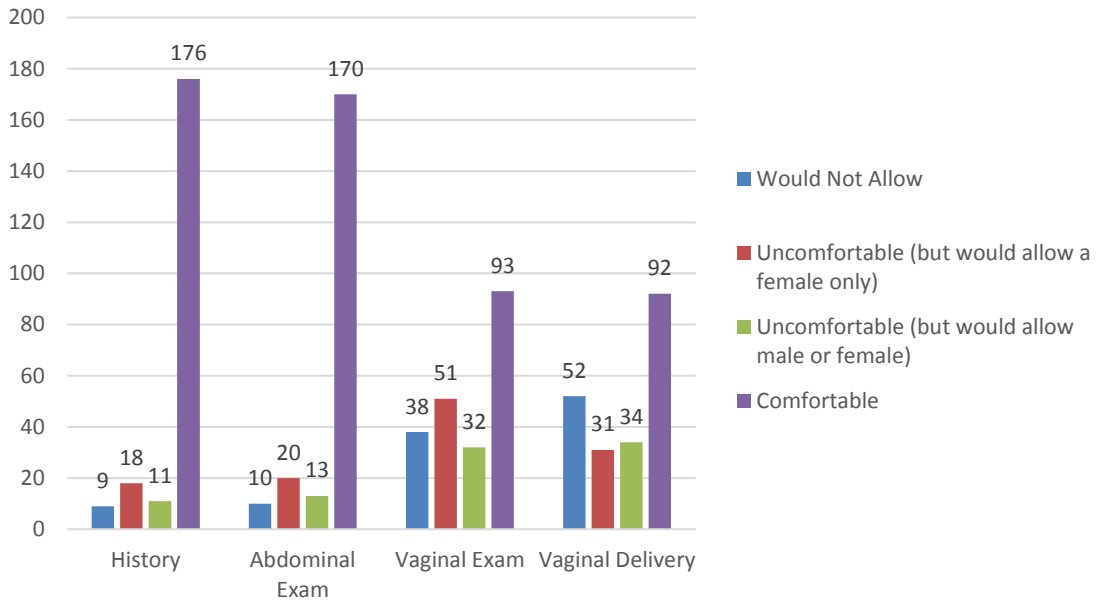

Figure 2: Patient comfort with students performing clinical tasks.

Parity

Comparison of nulliparous versus parous patients, showed that having a child did not significantly increase the likelihood of a woman being comfortable with students observing a physician in any of the clinical scenarios (Figure 3). Furthermore, in comparison to nulliparous patients, parous patients did not have an increased likelihood of being comfortable with students taking a history, performing an abdominal exam, or performing a vaginal exam. However, parity did prove to significantly increase the likelihood that a patient would be comfortable with a student performing a vaginal delivery, with 48.5% of parous women and 33% of nulliparous women stating that they would be comfortable ($p<0.05$) (Figure 4).

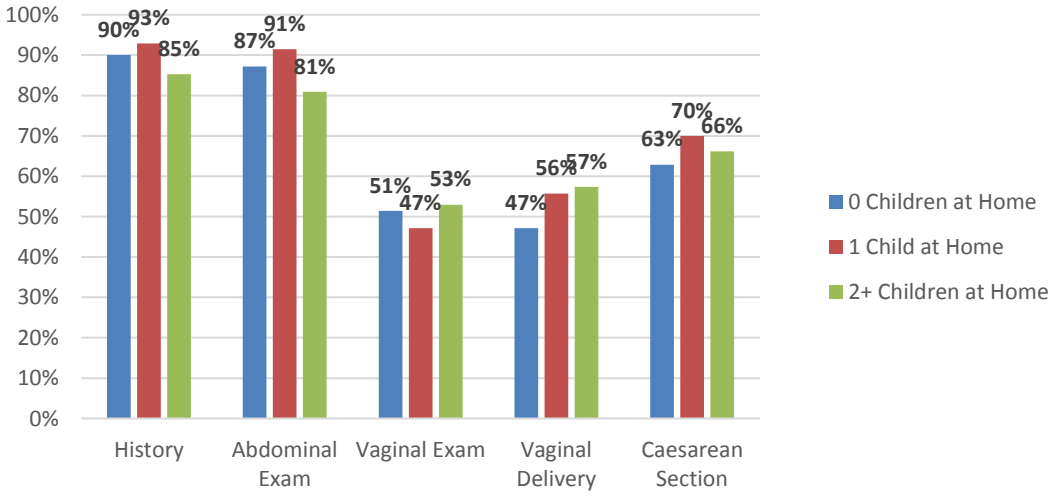

Figure 3: percent of patients comfortable with clinical tasks being observed by students.

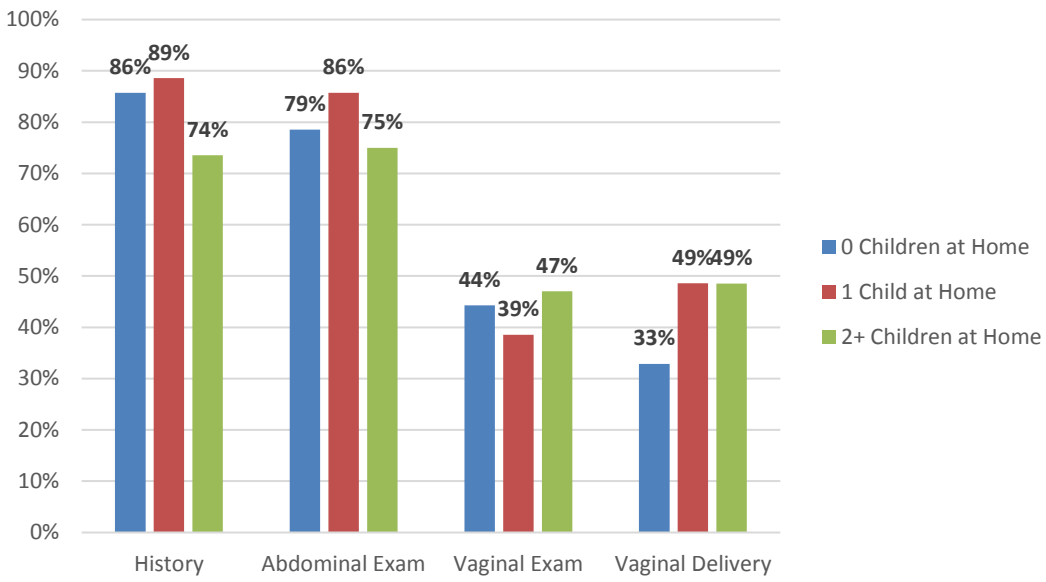

Figure 4: percent of patients comfortable with clinical tasks being performed by students.

Age

Age appears to be a greater determinant of how comfortable a woman might be with student presence. Those in the age group of 26-40 were significantly more comfortable with students observing a physician take a history and perform an abdominal exam compared to those aged 18-25 ($p<0.05$). There was no statistically significant difference between the 18-25 age group versus the 26-40 age group when it came to comfortability with students observing a vaginal exam. However, in comparing the 18-25 group against the 40+ group, those aged 40 and over were significantly more likely to be comfortable with a student observing a physician perform a vaginal exam ($p<0.05$). With respect to observing deliveries, comparing all three age groups showed that there was no statistically significant difference for observing a vaginal delivery, while the 26-40 group were significantly more likely to be comfortable with a student observing a caesarean delivery than those aged 18-25.

Age did not significantly impact whether a patient was comfortable with a student taking a history. Those aged 26-40 were more likely than those aged 18-25 to be comfortable with a student performing an abdominal exam ($p=0.048$). Those aged 26-40 were not significantly more likely than age 18-25 to be comfortable with a student performing a vaginal exam or vaginal delivery, however, those over 40 were significantly more likely than age 18-25 to be comfortable with both ($p=0.036$ and $p=0.004$). It is important to note that while age and parity had varying impacts on patient comfortability, we did not account for a separation between Obstetrics patients and Gynaecology patients, nor did we explore the impact of those who were attending hospital for the first time. These factors would be an informative area of further exploration.

Discussion

Medical student clinical involvement in core Obstetrics and Gynaecology clerkships varies between countries, and indeed between medical schools. However, the exclusion of students in this specialty is not unique to any one country or medical school – Baecher-Lind et al. found that after completing their Obstetrics and Gynaecology clerkship in America, students reported "low levels of student involvement and, subsequently, an overall passive learning environment" with the hypothesized reason being the overprotective nature of Ob/Gyn.[4] This is particularly interesting given that another American study found rates of medical student acceptance by patients in outpatient Ob/Gyn settings to be upwards of 80%.[5] It appears that patient acceptance of students is in part driven by the desire to contribute to medical education.[5, 6, 7, 8]

To date, no studies have been done in Ireland to assess the attitudes of women towards medical student involvement in their obstetric and gynaecologic care. Without a thorough understanding of how patients view medical students, it would be easy to assume that given the sensitive nature of obstetrics and gynaecology, most patients would not want a student present. However, the results of this study are encouraging and may prove to be useful in improving medical education.

We have demonstrated that in Ireland, a minority of women would refuse to have a medical student present in all clinical scenarios presented in the questionnaire. Providing this data to doctors and other health care professionals who are responsible for teaching students in obstetrics and gynaecology could result in an increased willingness to involve students in patient care. While keeping in mind the importance of patient wishes and consent, it is possible that patient willingness to allow for student participation may be underestimated in Irish hospitals. Interestingly, an underestimation of patient acceptance of medical students in obstetrics and gynaecology is not unique to Ireland. A 2014 American study surveyed patients on their beliefs surrounding medical education and student involvement in their care, as well as surveying healthcare providers on what they expected the patient response would be. Indeed, providers underestimated the value and acceptance patients have for medical students.[9] Further to this point, another study in 2019 found no statistically significant difference in patient satisfaction when comparing Labour and Delivery patients who had a student involved in their care to those who did not.[10] In fact, research regarding how patients view medical students in other specialties, specifically, internal medicine, found that patients *appreciated* active student involvement, and that it contributed to a greater perception of "patient-centeredness".[11]

The exclusion of medical students from clinical experience is not for a lack of patient understanding. An Australian study found that 84% of antenatal patients agreed that participation in intrapartum care was important for student education.[12] However, when consenting patients on medical student presence, we must be clear on their role. The same study found that only 54% knew that "medical student" specifically refers to doctors-in-training, and does not include students training to be nurses or midwives.[12] Therefore, we must also consider the role patient education plays in their acceptance of medical students.[13]

It is important that we continue to explore patient beliefs and perceptions regarding medical students. Not only *how* patients feel, but *why.* We must be critical of whether we are underestimating patient comfortability and if we are underserving students in the delivery of clinical experience. The results of this study are one step towards a better understanding in Ireland.

Obstetrics-gynaecology patients in an Irish health care setting are willing to involve medical students in their care. Majority of the patients involved in this study are comfortable with student involvement, whether in an observational or hands-on capacity. Parity appears to have less of an impact on patient comfortability than age, with older women being more comfortable in most clinical scenarios. These results are an important guide to Irish health care professionals and students as they consider what level of student involvement is appropriate in clinical teaching. Given that this is the first study in Ireland assessing this matter, more research is needed to determine how we can make advances in medical education while maintaining the highest standard of patient care and safety.

Declaration of Conflicts of Interest:
The authors declare no conflict of interest

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P461

Transanal Endoscopic Microsurgery (TEM) for Early Rectal Cancer

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Abstract

Aim

To determine the efficacy and safety of TEM compared to radical surgical resection (RSR) in patients with early rectal cancer.

Methods

A meta-analysis was performed following a search of the Pub Med, EMBASE and Cochrane Central Register of Controlled Trials databases. Only randomised controlled trials comparing TEM and RSR were considered for inclusion.

Results

Four trials with a total of 363 patients with early rectal cancer were included. There was no difference in over-all survival (OR 0.93; 95% CI), in rectal cancer-specific survival (OR 1.08; 95% CI), or for distant metastasis (OR 0.86; 95% CI) between the two groups. There was shorter length of hospital stay (OR -3.28; 95% CI), shorter operating time (OR -81.82; 95% CI), less blood loss (OR -138.70; 95% CI) and fewer post-operative complications (OR 0.30; 95% CI) in the TEM group. However local recurrence rate was higher in the TEM group compared to RSR.

Conclusion

This study has shown that in patients with early rectal cancer, TEM does offer oncologic control comparable to RSR and is associated with shorter hospital stay, less operating time, less blood loss and less post-operative complications. However, there appears to be a higher rate of local recurrence that warrants further study.

Introduction

Colorectal cancer (CRC) is considered as one of the leading causes of cancer death in developed countries and causes significant morbidity and mortality resulting in a large global economic burden. Geographical incidence varies, with around 60% of cases occurring within developed countries and it is the 4th and 3rd most common cause of cancer deaths in men and women respectively.[1] In Europe, at least one third of colorectal cancers are located in the rectum, causing 15 to 25 cases per 100,000 inhabitants per year and although colon and rectal cancer share similar features there is a distinct difference in clinical presentation and management approach.[2] The prognosis is very much dependent on the stage of the CRC at the time of the diagnosis and the Royal College of Pathologists recommends that the 5th edition of the TNM staging system is used for colorectal cancer reporting at a national level.[3,4]

The conventional surgical treatment for cancer of the rectum are associated with a high morbidity and poor long-term functional outcomes with postoperative mortality rates ranging from 2% to 6%. Postoperative complications, such as neurogenic bladder, sexual dysfunction, faecal incontinence along with the psychological and social consequences of a colostomy, have been reported at 30% to 46%.[5, 6]

Given the significant complications from RSR, transanal local excision of early rectal cancer is became an attractive alternative as it is associated with less postoperative pain and a shorter length of hospital stay. Furthermore, newer methods such as TEM or transanal minimally invasive surgery (TAMIS) have been introduced that provide better visualization of tumours in the mid and upper rectum.[7]

The aim of this study was to compare transanal local excision, via TEM, with RSR in terms of oncologic control (survival and recurrence) and safety (intra & postoperative complications) in adult patients with early rectal adenocarcinoma (T1 - T2 N0 M0).

Methods

A systematic review was performed in adherence with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement and the Cochrane Handbook for Systematic Reviews of Interventions.[8-10] We only included randomised controlled trials (RCTs) and included studies had trial participants with early rectal cancer, (T1-T2, N0, M0) defined as lesions limited to the bowel wall with no disease extension beyond the submucosa (T1) or the muscularis mucosa (T2). Furthermore, there was no evidence of lymph node spread (N0) on pelvic MRI and/or Endo-Rectal Ultrasound (ERUS), no distal metastasis (M0) and patients were 18 years of age or older. The intervention assessed was conservative management in the form of TEM which was compared to conventional radical surgical resection in form of open anterior resection, laparoscopic anterior resection, abdominal perineal resection with or without Total Meso rectal Excision (TME).

The primary outcome was overall survival and secondary outcomes were rectal cancer-specific survival, local recurrence, distant metastases, length of hospital stay, operating time, intra-operative blood loss and post-operative complications.

All studies were at least one-year duration for follow-up of outcomes and there were no restrictions by type of setting or by languages of publication.

We designed a comprehensive search strategy with support from a medical librarian, a rigorous search of the literature supplemented by hand searching and retrieval of any additional articles meeting eligibility criteria was done:

Electronic searches of the following databases were performed:

MEDLINE / Pub Med (OVID interface, 1948 onwards).
EMBASE (OVID interface, 1980 onwards).
Cochrane Central Register of Controlled Trials (Wiley interface, current issue).
Grey literature databases: Open SIGLE (http:// opensigle.inist.fr/).

Other sources searched were as follows:

Dissertations and theses databases: Pro Quest Dissertations & Theses Database.
Conference abstracts or proceedings databases (ISI Proceedings).

The literature search was limited to human subjects without any date of publication restriction and the most recent search was performed on May 15, 2018.

Two reviewers independently identified the trials for inclusion by screening the titles and abstracts, according to the 2010 CONSORT Statement for RCTs.[11] We sought full-text articles for any references that at least one of the reviewers identified for potential inclusion. We selected the trials for inclusion based on the full-text articles and to enhance sensitivity, records were removed only if both reviewers excluded the record at the initial screening level. The flow diagram in Figure 1 describes the inclusion and exclusion process.

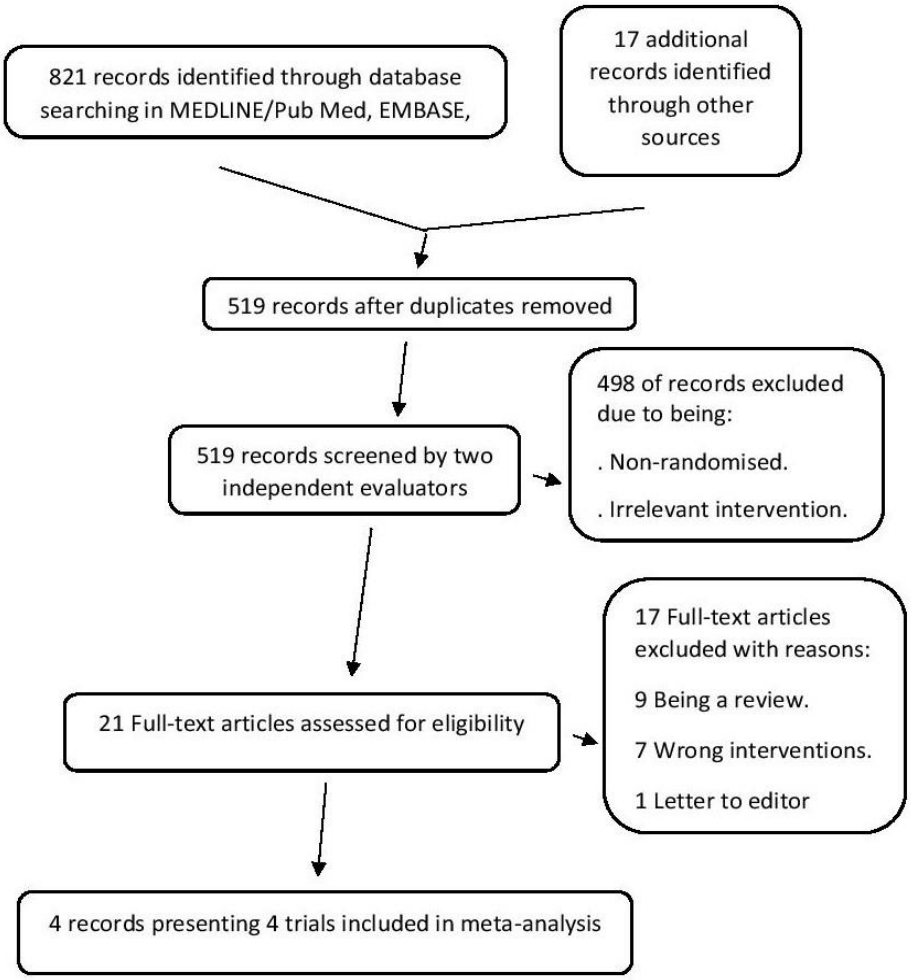

Figure 1: Study Flow Diagram.

Literature search results were processed in Microsoft Excel and we extracted data relating to patients with early rectal cancer, transanal local excision, or radical surgical resection. Two authors independently assessed the risk of bias and evaluated the quality of randomised controlled trials included in the systematic review and meta-analysis using a modified version of the Cochrane Collaboration's Risk of Bias tool. A modified version of the Newcastle-Ottawa Scale and the guidance given in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins 2011) [12] for factors considered included the quality of the random sequence generation and allocation concealment, incomplete outcome data, blinding (participants, personnel and outcome assessors), selective outcome reporting and other risk factors.

With regard to measurement of treatment effect for dichotomous variables (e.g., Overall survival, Rectal cancer-specific survival, Local recurrence or Distant metastasis), we calculated the odds ratio (OR) with 95% confidence intervals (CI). For continuous variables (e.g., Length of hospital stay, Operating time, Blood loss or Post-operative complications), we calculated the mean difference with 95% CI.

Results

The database and other sources searches identified 838 references which were reduced to 519 after duplicates were removed. These references were screened by two reviewers according to the criteria defined above, and we excluded 498 references as non - randomised or irrelevant intervention. The full texts of the remaining 21 references were obtained. Seventeen were excluded and four trials included, involved 363 participants. Their Characteristics are reported in Table 1.

Table 1: Characteristics of included studies.

RCT Randomised control trial, (I) Intervention group, (C) Comparison group.
M: Male, F: Female. TEM Transanal Endoscopic microsurgery.

Study (Year)	Type of study	Study period	Country	Participants	(I) group (n)	(C) group (n)	Mean age in years (Range)		M: F ratio	
							(I)	(C)	(I)	(C)
Winde. (1996)[13]	RCT	1984–1992	Germany	T1N0M0	24	26	63.7 (36-90)	60.9 (47-81)	0.7	1.2
De Graaf. (2009)[14]	RCT	1996-2001	Netherland	T1N0M0	80	75	71 (44-92)	67 (48-83)	23:48	27:48
Lezoche. (2012)[15]	RCT	1997–2004	Italy	T2N0M0	50	50	66 (58-70)	66 (60-69)	30:20	34:16
Chen. (2013)[16]	RCT	2008–2010	China	T1, T2N0M0	28	30	68.8 +/-5-3	66.2 +/- 7-7	14/16	17/13

Study (year)	Outcomes
Winde et al. (1996)	Mortality, early and late morbidity, operative time, blood loss, hospitalization time, post-operative pain and survival rate.
De Graaf EJ et al. (2009)	Morbidity, mortality, margin status, local recurrence, distant recurrence, overall survival and cancer-specific survival.
Lezoche et al. (2012)	Oncological failure, death from rectal cancer after min 5Y follow up, morbidity, 30 days mortality, operative time, blood loss, analgesic use and hospital stay
Chen et al. (2013)	Surgical morbidity and mortality, operative time, blood loss, conversion rate, post-operative recovery time and local recurrence.

Survival Rate

The period of follow-up in these trials varied between 18 and 127 months and the four trials reported no statistically significant differences in over-all survival between the two groups (TEM group: 13/182) vs (RSR group: 11/181); OR 1.55 [0.53, 4.54], (95% CI), Heterogeneity: $Chi^2 = 1.34$, df = 2 (P = 0.51); $I^2 = 0\%$, Test for overall effect: Z = 0.80 (P = 0.43), (Figure 2). Also, the four trials reported no statistically significant differences in rectal cancer – specific survival between the two groups (TEM group: 10/182) vs. (RSR group: 9/181); OR 1.08 [0.44, 2.67], (95% CI), Heterogeneity: $Chi^2 = 0.86$, df = 2 (P = 0.65); $I^2 = 0\%$, Test for overall effect: Z = 0.17 (P = 0.87), (Figure 3).

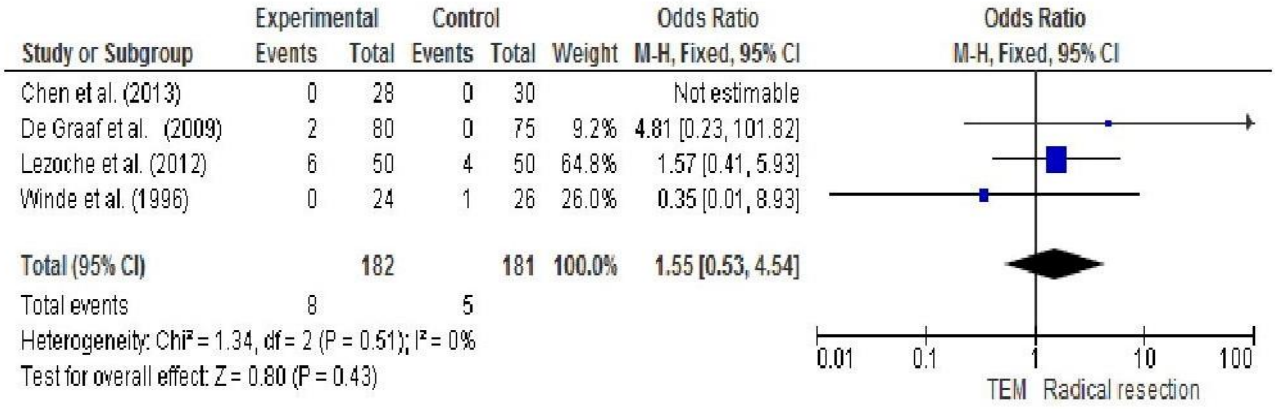

Figure 2. Forest plots comparing over-all survival of TEM versus Radical resection. CI=confidence interval, TEM=Trans anal Endoscopic Microsurgery, OR=odds ratio.

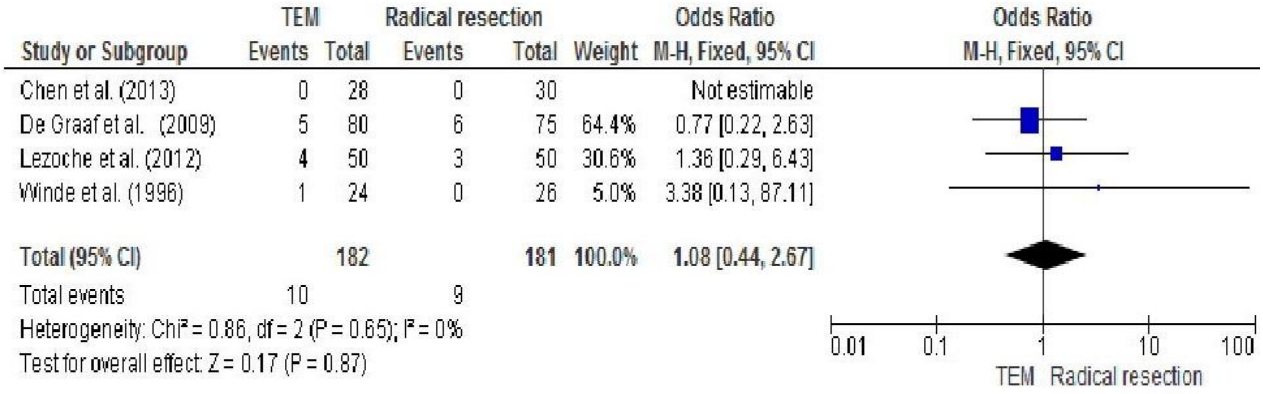

Figure 3. Forest plots comparing rectal cancer – specific survival of TEM versus Radical resection. CI=confidence interval, TEM=Trans anal Endoscopic Microsurgery, OR=odds ratio.

Recurrence

In one study, (De Graaf et al. 2009),[14] fifteen participants (24%) in the TEM group versus none in the RSR group had local recurrence at median follow-up of 42 and 84 months for TEM and RSR group respectively, (P = 0.00001).

Results of the other three studies showed no statistically significant differences between the two groups (TEM group: 7/102) versus (RSR group: 3/106) in relation to local recurrence.

When all four trials were analysed in a forest plot, De Graaf et al. 2009,[14] with the largest number of participants (155 patients) has driven the results to record TEM as being associated with high local recurrence rate in comparison to RSR group; OR 5.59 [2.01, 15.53], Heterogeneity: $Chi^2 = 4.92$, df = 3 (P = 0.18); $I^2 = 39\%$, Test for overall effect: Z = 3.30 (P = 0.001).

For distant metastasis, Results of all four studies showed no statistically significant differences between groups (TEM group: 8/182) vs (RSR group: 9/181); OR 0.86 [0.33, 2.23], Heterogeneity: $Chi^2 = 0.34$, df = 2 (P = 0.84); $I^2 = 0\%$, Test for overall effect: Z = 0.32 (P = 0.75).

Length of Hospital Stay

There were significant reductions in the length of hospital stay between the TEM group and RSR group, OR -3.28 [-3.43, -3.12], Heterogeneity: $Chi^2 = 270.92$, df = 3 (P < 0.00001); $I^2 = 99\%$, Test for overall effect: Z = 42.43 (P < 0.00001).

Operating time

The TEM group in all four studies had a significantly shorter operating time compared to RSR group, OR -81.85 [-83.90, -79.80], Heterogeneity: $Chi^2 = 117.76$, df = 3 (P < 0.00001); $I^2 = 97\%$, Test for overall effect: Z = 78.20 (P < 0.00001).

Blood Loss

The TEM group in all four studies had significantly less blood loss compared to the RSR group, OR -139.24 [-153.02, -125.24], Heterogeneity: $Chi^2 = 807.79$, df = 1 (P < 0.00001); $I^2 = 100\%$, Test for overall effect: Z = 19.81 (P < 0.00001). In two studies, no patient in TEM group received blood transfusion, whereas ten (20 %) in the RSR group had blood transfusion (P<0.001), and one patient (3.3 %) in the RSR group had blood transfusion (P=1.000), in Lezoche et al. (2012)[15] Chen et al. (2013)[16] respectively.

Post-operative complications

The TEM group in general, were associated with less post-operative complications compared to the RSR group. 3 trials showed less, but not statistically significant, post-operative complications with the TEM group (Winde et al. (1996)[13] Lezoche et al. (2012)[15] Chen et al. (2013)[16]), OR 0.70 [0.35, 1.38], Heterogeneity: $Chi^2 = 0.76$, df = 2 (P = 0.68); $I^2 = 0\%$, Test for overall effect: Z = 1.03 (P = 0.30). One trial (De Graaf et al. (2009) [14]) had significantly less post-operative complications compared to the RSR (TEM group: 5/80) vs (RSR group: 48/75); (P < 0.00001).

Discussion

Well-conducted randomised trials investigating TEM are scarce. All included RCTs compared TEM as intervention to RSR for patients with T1 or T2, N0 M0 rectal cancer, and reported our primary outcome 'overall survival'. The study by Chen et al. 2013[16] had a short follow-up (18 to 21 months) compared to the other three trials (45 to 65 months). However, it is remarkable that these studies comparing TEM, to other forms of conventional RSR showed no significant differences on overall survival in both treatment arms.

Also, all included studies reported most of our secondary outcomes, study results showed that TEM is comparable to conventional RSR, in appropriately selected early rectal cancer patients, in relation to rectal cancer-specific survival, local recurrence and distant metastasis. They also showed favourable results in length of hospital stay, operating time, blood loss and post-operative complications.

However, in relation to local recurrence, the results of three studies (Winde 1996[13], Lezoche 2012[15] and Chen 2013[16]) showed no statistically significant differences between the two groups (TEM group: 7/102) versus (RSR group: 3/106). When all four trials were analysed in a forest plot De Graaf et al. 2009 [14] with the largest number of participants (155 patients) has driven the results to record TEM as being associated with a high local recurrence rate in comparison to the RSR group. Adjuvant or neo-adjuvant radiotherapy with or without the addition of chemotherapy have been reported in this context, with variable results. There are no current guidelines recommending radio-chemotherapy for T1-T2 node-negative rectal tumours. Also, patients with local recurrence still can go for salvage surgery, without need for multivisceral resections and without adding a significant postoperative mortality.

No study from the four studies included in this review has mentioned that if the local recurrence was luminal or nodal.

Our review included four randomised controlled trials with 363 participants. The study samples included in this review are relatively small ranging from 50 to 155 participants. In general, there was no evidence of heterogenicity in most comparisons with the exception of the local recurrence in the comparison TEM versus conventional RSR, only in one study (De Graaf et al. 2009).[14]

We agreed with several systematic reviews and meta-analysis, mainly for non-randomised prospective studies, as this is the first systematic review and meta-analysis including only randomised controlled studies, that showed that, for patients with T1 and T2 rectal cancer, the overall survival, rectal cancer-specific survival and distant metastasis did not differ between the TEM and RSR groups (Lu J-Y 2015[17], M. S. Sajid 2013[18]).

Our results agree with several systematic reviews and meta-analysis that in selected cases of early rectal cancer, TEM is superior to standard RSR concerning length of hospital stay, operating time, blood loss and post-operative complications especially need for stoma and anastomotic leakage (Sgourakis G 2010[19], Kidane B 2015[20]).

The present review has a number of limitations. Two of the included trials presented their results with some missing original data, and we failed to get a response from authors regarding this, so we estimated the mean and standard deviation instead. Also, one of the flaws of this review is the combined analysis of trials with and without the use of neoadjuvant chemotherapy or chemo radiotherapy.

In conclusion, in selected Patients with early rectal cancer (T1 - T2 N0 M0), TEM does offer oncologic control comparable to conventional RSR in terms of overall survival, rectal cancer-specific survival and distant metastasis. TEM is associated with lower length of hospital stay, operating time, blood loss and post-operative complications.

However, regarding local recurrence, our meta-analysis has clearly shown an increase in local recurrence for patients receiving local resection alone compared to RSR.

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

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P462

Trainee Knowledge and Perceptions of Less Than Full Time Training

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Abstract

Background

Less than full-time (LTFT) training in Ireland is still unusual. Our aim was to identify perceived barriers to LTFT training amongst paediatric trainees and make recommendations to improve knowledge, uptake, and experience of LTFT training.

Methods

An email questionnaire was disseminated to RCPI paediatric trainees to assess current awareness of and perceptions of barriers to LTFT training.

Results

218 questionnaires were distributed, 59 (29%) responded of whom 50 (85%) were female. 17 planned to apply for LTFT training. Seven had no knowledge of LTFT training. The perceived barriers with the highest rankings (% respondents deeming highest possible relevance) were: LTFT post availability (49%), potential impact on career progression (51%), and availability of only 0.5 whole time equivalency (WTE) – i.e. 19.5 hours/week (54%). Trainees noted lack of flexibility, including availability of the scheme only from July to July, restriction to maximum 2 years. Trainees felt applications would be rejected if they were not a parent. Some reported perceptions from teams that LTFT trainees are less committed and that trainees can find it difficult to integrate.

Discussion

Training options including >0.5WTE posts should be made available to all trainees, and a cultural shift within training bodies and with trainers should be encouraged to recognise LTFT training as an acceptable pathway for all trainees.

Introduction

Less than full time (LTFT) training has been recognised as an important tool for the creation of better work-life balance and avoidance of burnout in the medical workforce[1]. The 2019 Royal College of Physicians of Ireland (RCPI) National Study of Wellbeing of Hospital Doctors in Ireland identified that 80% of doctors reported not having enough time for family or personal commitments due to working hours, and that one in three doctors were suffering from burnout[2]. The 2014 MacCraith Report stated that "more flexible and differentiated approaches and options during training that take account of family, research or other constraints should be explored by HSE-MET and the Forum of Irish Postgraduate Medical Training Bodies[3]." In the 9th review of recommendations made by the MacCraith report, published in January 2019, trainee feedback continued to include issues around flexible training and working hours[4].

Currently the Irish medical training system allows for two types of less than full time training. The first option is the HSE National Supernumerary Flexible Training Scheme, managed and funded by the HSE National Doctors Training & Planning (NDTP)[5]. This scheme offers 1-year 0.5 whole time equivalent (WTE) posts to 32 trainees per annum across all specialities. This has been open to all trainees excluding 1st year BST since July 2017. There are currently 13 postgraduate training bodies in Ireland, with a total of 1752 trainees in higher specialist training or streamlined training in 2018-2019[6]. If successful in their application, a trainee is offered a post which is supernumerary to the usual requirements for a given medical team, which usually allows the candidate some freedom to choose a position that they wish to work in. The second option is job sharing, which works on the basis that two trainees will share one full-time post with each trainee working 50% of the hours for up to 12 months[7]. This necessitates that two trainees be eligible to fill one existing post rather than be supernumerary to requirements. Current training policies in some training bodies have limited the length of time within which a training scheme must be completed, which may preclude a trainee from availing of an extended period of LTFT training, and the National Supernumerary Flexible Training Scheme restricts trainee participation in the scheme to a maximum of two years [5,7].

The aim of this study was to identify the barriers to trainees engaging with less than full time training as it is currently structured and to make recommendations based on the data gathered to improve trainee awareness, access and experiences.

Methods

All RCPI paediatric trainees were invited to respond to a questionnaire regarding LTFT training. Data gathered included the trainee's awareness of the process, whether they intended to apply for LTFT training, and what their perceptions of potential barriers to LTFT training were.

The questionnaire was administered via Survey Monkey, an online survey tool. The Programme Coordinator for Paediatrics in the RCPI was contacted with the request to distribute the survey and they arranged for the survey to be distributed via an email link to all paediatric trainees on their mailing list.

A participant information sheet was included with the email to provide paediatric trainees with information on the purpose of the survey. The survey was open for a two month period between June and July 2019, in order to capture trainees returning to work and new entrants to paediatric training after the NCHD "changeover" date in July.

Following closure of the survey, the anonymised data was exported and analysed.

Results

The survey was distributed to 218 RCPI paediatric trainees. There were a total of 64 responses (29%) to the questionnaire, 59 of which were complete. Nine of the responses were from male trainees (15%). Three of the responses were from current or former LTFT trainees and 17 respondents were planning to apply for the scheme at some point in their training. Seven trainees were not previously aware of the option of LTFT training.

Trainees were asked to rank different potential barriers to LTFT training, on a Likert scale of 1-7 (with 1 equating to not relevant and 7 extremely relevant). When looked at as a whole group, trainees rated the potential impact on career progression, available number of posts, and availability of only 0.5WTE posts as the biggest barriers to LTFT training when the cumulative highest total is used, i.e. relevance 6 and 7 (Table 1). For female trainees who had children, the key concerns were salary (i.e. loss of earnings), delay in CSCST date, impact on career progression and childcare costs. Male trainees were most concerned about impact on career progression and availability of LTFT posts.

	1- Not at all relevant	2	3	4	5	6	7- Extremely relevant	Cumulative highest relevance (%)
Salary	1	2	1	10	18	10	17	27 (46)
Delay in CSCST date	5	3	8	8	11	10	14	24 (41)
Logistics of childcare arrangements	6	4	6	9	7	10	17	27 (46)
Cost of childcare	7	3	2	3	16	13	15	28 (47)
Availability of LTFT posts	2	1	3	13	10	9	20	29 (49)
Availability of only 0.5WTE	1	4	3	10	9	11	21	32 (54)
Impact on career progression	0	5	4	7	13	8	22	30 (51)
Culture	7	2	3	10	14	8	14	22 (37)

Table 1: Barriers to LTFT training, ranked by trainees according to relevance on Likert scale.

Trainees were asked to elaborate on additional potential barriers to LTFT training in a free text field. They identified inflexibility of LTFT training options, with specific limitations including: restricted availability of the NDTP's flexible training scheme to a July to July basis (i.e. lack of availability to someone looking to take up a post from January); restriction of LTFT training to a maximum of 2 years, and that the LTFT posts were limited to 0.5WTE (Table 2). This is seen as a key issue – respondents referred to the availability of 0.6 and 0.8WTE posts in the UK and that trainees are able to continue this until completion of their training if they so choose.

Multiple trainees also discussed perceived negatives in applying for the National Supernumerary Flexible Training scheme. Two issues were highlighted. Firstly, the belief that their application may be rejected by the scheme if they were not a parent. The second concern cited the perception from teams and consultants that participation in flexible training is a sign of lack of commitment on the trainee's part and that trainees can find it difficult to integrate into the team.

Finally, trainees mentioned salary difference as an issue, and in particular noted that the policy of overtime pay at single time extra rate until WTE hours are reached i.e. 39 hours per week, puts LTFT trainees who contribute to a 24-hour call rota at a significant disadvantage in their salaries compared to full time colleagues.

Trainee A	"LTFT is culturally frowned upon. It is seen only as "for mums". Single women and men are not expected to apply."
Trainee B	"I have met people (male and female) working in the UK on 0.8 time (4 days/week) and 0.6time (3 days/week) who continue this for any number of years and this is accepted as a reasonable lifestyle choice, whereas here I would fear being seen as "less able" for full-time work or "less committed" to [my] career"
Trainee C	"On call is only paid at basic rate for staff on less than 39hrs. This is very unfair on call that I was paid significantly less given I had worked my contracted hours regardless that they were less than 39hrs. I was told this was a HSE policy but feel this should be adjusted for NCHDs who have to work 24hr shifts and nights"
Trainee D	"I wanted to apply for this and was told I couldn't because I was coming back to work in January and the post had to start in July. This seemed to be counterintuitive and ironically very inflexible."

Table 2: Opinions of individual trainees on barriers to less than full time training and system changes that could be addressed.

Discussion

Working conditions for many Irish trainees has led to an exodus to other countries where working conditions are perceived to be superior. The Irish Medical Council's 2018 Workforce Intelligence Report showed 1,453 voluntary withdrawals from the medical register, representing a 37.9% increase on the previous year. Seventy percent of these doctors left Ireland to work in another country[8]. Reasons cited included long hours, lack of flexibility, personal and family issues and poor staffing.

These findings were echoed in Humphries' 2018 work on factors responsible for emigration of Irish doctors and reasons for failure to retain Irish trainees within the workforce[9]. Much of the dissatisfaction with working conditions in the Irish healthcare system was related to generationally held views on medical practice – working long hours with a heavy workload to "prove" oneself, and prioritising career above all else. While attitudes to this long-held cultural norm in medicine are changing, it may take time to change the system to one that is more accepting of the importance of work-life balance. Our survey highlights the concerns of paediatric trainees that these attitudes persist and are perceived as a barrier to pursuing LTFT training. Interestingly, a recent study of consultant attitudes to LTFT trainees (which was undertaken in an Irish paediatric hospital) found that most of the surveyed consultants approved of LTFT training as a pathway for training, but disadvantages of training in this way to both the NCHD and clinical team were noted[10]. This suggests that a culture shift may already be underway in paediatrics, but it is not yet clear if these findings can be extrapolated to other medical and surgical specialities.

The current structure of LTFT training in Ireland needs to be revisited and reorganised. Many respondents were concerned about the lack of flexibility of the available options, given the strict application criteria, limited number of places and availability of only 0.5 WTE. The application criteria currently requires trainees to "have well founded individual reasons for flexible training", and goes on to list the most common reason for this to be "responsibility for caring for others (e.g. children or elderly relatives)"[5]. Generally, this is interpreted as meaning an application will be rejected unless you are a parent, and more specifically, a mother. Because of this, some respondents believed their applications would be rejected if they were to apply. Regarding the availability of different WTE posts, the National Supernumerary Flexible Training Scheme has been reviewed in 2020 and now states "provisions can be made to facilitate arrangements outside of 50% of full time, depending on circumstances." The specific circumstances in which this may be offered has not been elaborated upon.

The HSE and training bodies could look to the NHS for guidance. In 2005, the NHS, in collaboration with the British Medical Association Junior Doctors Committee (JDC), the Department of Health and other UK Health Departments, and the Conference of Postgraduate Medical Deans published clear principles for the development of more comprehensive LTFT training options for all doctors within the NHS[11]. This includes clear guidance that all trainees can apply for less than full time training and allows for a variety of training options from 0.5 WTE up to 0.8 WTE.

More engagement is needed between the HSE, postgraduate medical training bodies and representative organisations such as the Irish Medical Organisation to discuss a more comprehensive approach to LTFT training in Ireland, to encourage trainee retention and ensure a better quality of life for medical trainees. While LTFT training undoubtedly presents logistical challenges for the HSE and training bodies, LTFT training improves trainee's quality of life[1] and work life balance and is likely to reduce trainee burnout and improve staff retention, which constitute major challenges for the Irish health service[2].

A limitation of the current study is the low response rate of 29%. This may partially reflect the inclusion of the trainees from basic specialist training (BST) in the distribution of the survey. Currently 1st year BST trainees are not eligible to apply for the National Supernumerary Flexible Training Scheme[5]. In the year that this survey was conducted, there were 40 1st year BST trainees (out of 218 total trainees)[6], and as they are not eligible, they were unlikely to respond. There is clear interest in flexible training in paediatrics based on the number of trainees that are awarded flexible training posts since the creation of the scheme – paediatrics ranks 3rd of all specialities in number of flexible trainees since 2002 and in 2020 had the second highest number of trainees enrolled in the flexible training scheme (7 out of 32 trainees)[12]. There were additional trainees who availed of job-sharing posts outside of the National Supernumerary Flexible Training Scheme in addition to these posts as the demand for the scheme exceeded the number of posts available[12]. Engagement with the questionnaire may have been improved by the use of reminder emails or the use of an in-person questionnaire at a Faculty of Paediatrics study day.

Suggested recommendations from this study are as follows: 1. Training bodies and the HSE/NDTP should issue strong statements of support for LTFT training. 2. LTFT training options should be expanded. 3. Time limits on the duration of LTFT training should be removed. 4. LTFT training should be open to all trainees. 5. There should be better engagement with trainees at all levels. 6. Awareness campaigns should be conducted to highlight positive experiences of LTFT trainees and to give accurate information on potential impact on salary, pension etc. 7. Teams should receive education on working with LTFT trainees. 8. A central hub for the coordination of LTFT training options should be considered (possibly through the NDTP).

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

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P463

Categorisation of Caesarean Section and Decision to Delivery Time in a Peripheral Maternity Unit

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Abstract

Aim

Classification of caesarean section is based on clinical definitions which correlate to the decision to delivery interval (DDI). The aims of this audit were to identify if categorisation is used and communicated correctly, to identify the reasons for each classification and to quantify the decision to delivery interval.

Methods

A retrospective audit of the first 48 Category one or two caesarean sections at Cavan General Hospital in 2018 was completed. The RCOG and NICE guidelines were used as standards.

Results

The indication for caesarean section was documented in all cases. Fetal distress was the most common indication for delivery (n=22, 45.8%). Categorisation documentation varied across Midwifery (n=48, 100%), Obstetrics (n=28, 58.3%) and Anaesthetics (n=15, 31.25%). The decision time was well documented (95%, n=46). The DDI was easily identified in all cases and was in line with international standards. The average time for Category one delivery (n=7, 14.5%) was 22.85 minutes (range 14-43) and 41.3 minutes for Category two (n=41, 85%) (range 11-96 minutes).

Discussion

It was evident that timely decisions were made, and good communication was noted. Decision to delivery interval times at Cavan General are in line with best practice standards. Education regarding categorisation, use of 'formal drill' and re-iterating the importance of documentation can lead to improvements in communication, maternal and neonatal outcomes.

Introduction

Categorisation of caesarean section is based on clinical definitions which correlate to the decision to delivery interval (DDI). An individualised approach to the urgency of a caesarean section is needed, however broadly speaking a DDI of under 30 minutes is viewed as an auditable standard for a maternity unit for a Category one Emergency. The categorisation of the caesarean section must be decided by either Obstetrician or Senior Midwife and the decision to proceed should be clearly documented. The category must be agreed and uniform amongst all staff including Obstetricians, Midwives, theatre staff and Anaesthetics.[1]

It is widely accepted that the traditional use of 'elective' and emergency' terms as classification of caesarean section yield very little for data collection, auditing of services and obstetric, anaesthetic and neonatal outcomes.[1] The varying degrees of emergency in obstetrics are not wholly applicable to other disciplines and so The National Confidential Enquiry into Patient Outcome and Death (NCEPOD), used widely in the UK for surgical procedures, has been highlighted as not applicable to caesarean section.[1] There have been varying classifications developed over the last twenty years, some proving useful and reliable in clinical practice such as the four-grade classification system by Lucas et al. (2000).[3] A modified version of this has been employed and encouraged by the Royal College of Obstetricians and the Royal College of Anaesthesists.[1]

The urgency classification of caesarean section is as follows: Category one, Emergency, immediate threat to life of woman or fetus such as cord prolapse or uterine rupture. Category II, Urgent, maternal or fetal compromise that is NOT life threatening such as placental abruption in the absence of maternal shock or failure to advance with pathological CTG. Category III, Semi-Elective, needs early delivery but no maternal or fetal compromise such as breech in early labour or failed induction of labour. Category IV, Elective, at a time to suit the patient and maternity services such as breech not in labour or maternal request.[1,3] It should be noted that this classification system is not a replacement for the Robson 10 Classification for caesarean section.[4]

According to NICE guidelines, DDI for Category one is 30 minutes and between 30 and 75 minutes for Category two.[2] The UK 'sentinel' caesarean section audit suggested that emergencies such as cord prolapse should have a DDI of 15 minutes.[5] A DDI of 30 minutes as a target for fetal compromise is a useful tool that enables the entire multidisciplinary team to be educated, informed and audited against. Despite this, it is important to note that certain clinical scenarios will necessitate a DDI of much less than 30 minutes and all clinicians should be aware of these cases. In addition, there must be an understanding that unnecessary haste or speed to achieve a certain DDI can pose risks from anaesthetic, obstetric and neonatal perspectives.[1,2]

The importance of communication must not be underestimated and is at the core of safe delivery and good maternal and neonatal outcomes. All members of the team should be informed of the need or potential need for caesarean section as soon as is clinically possible.

The categorization of the caesarean section is paramount within this communication, to highlight the degree of urgency.[1] Correctly identifying the category of delivery enables all members of the team to understand the clinical scenario, communicate efficiently and complete their designated tasks safely and in a time-sensitive manner.[1]

The purpose of this Audit was to assess if categorisation is used and communicated correctly, the reasons for each classification and to quantify the decision to delivery interval.

Methods

This was a retrospective chart review of the first 48 Category one or Category two Caesarean Sections completed at Cavan General Hospital in 2018. A predefined proforma was used and the RCOG and NICE Guidelines were adhered to.

Study Protocol

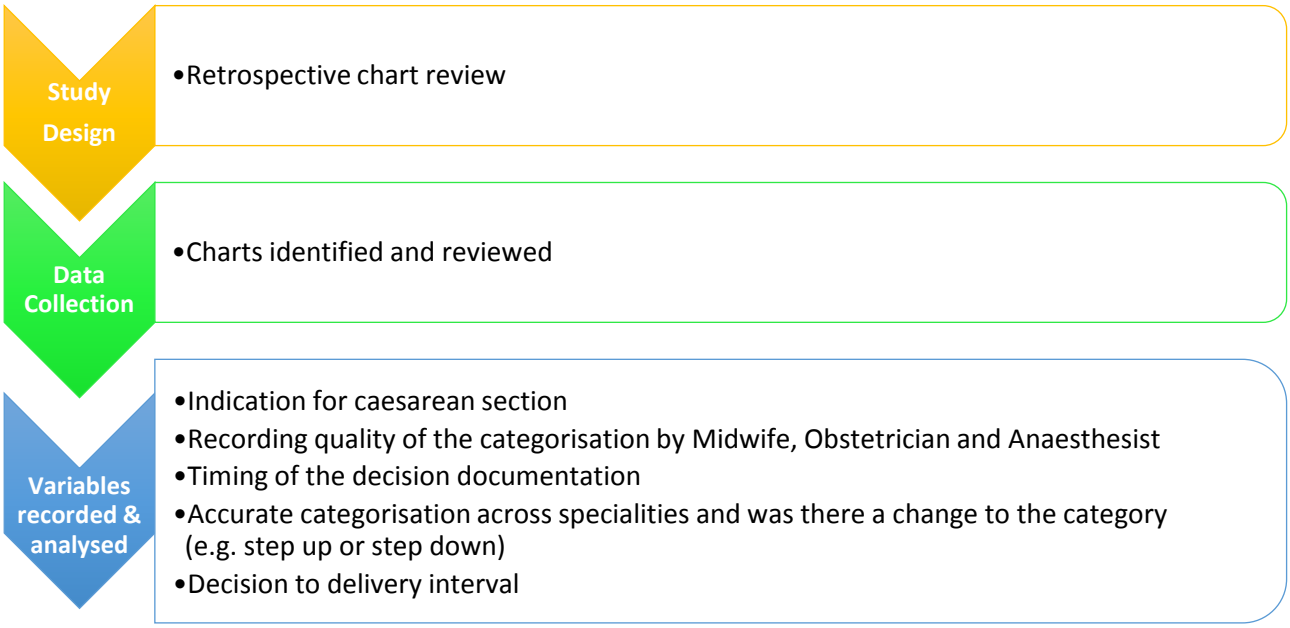

Figure 1: *Study design.*

Study Measures

The variables examined included the indication for caesarean section, the recording quality of the categorisation by Midwife, Obstetrician and Anaesthetist, timing of the decision documentation, accurate categorisation across specialities, was there a change to the category (e.g., step up or step down) and the decision to delivery interval.

Data analysis

All data was collected in an anonymized fashion and Excel was used for analysis.

Results

The indication for caesarean section was recorded each time (100%). This is depicted below in Table 1.

Table 1: *Indication for caesarean section.*

Indication for LSCS	Times cited as indication	% of cases
Abruption	1	2
Failed IOL	4	8.3
Failed instrumental delivery	3	6.25
Failure to advance/ progress	14	29
Fetal distress	22	45.8
Sepsis	1	2
>1 reason	10	20.8
Other	9	18.7

For deliveries with greater than one indication, fetal distress was the most commonly cited reason (n=6, 12.5%).

Table 2: *Breakdown of indications labelled as 'Other'.*

Indication for LSCS 'Other'	Times cited as indication	% of cases
Meconium Grade II	1	2
Placenta praevia with bleeding	2	4
Breech in labour	2	4
Non-substantial antepartum haemorrhage	1	2
Prior caesarean section with contractions	2	4
Face presentation	1	2

As shown below in Table 3. the documentation of the caesarean section categorisation was well recorded by midwifery staff. Categorisation on documentation was poor amongst both Obstetric and Anaesthetic staff.

Table 3: *Percentage of Recordings based on Medical Speciality**.***

Recording of categorisation	Number of recordings	% of cases
Midwife	48	100
Obstetrician (notes)	10	20.8
Obstetrician (operative)	18	37.5
Anaesthetist	15	31.25

Ninety-five percent of the charts had the time of decision documented. Regarding the two cases without documented timing of decision, one was a consultant-led delivery with overall poor documentation.

Although inadequately documented, the matching of categorisation between Anaesthetics and Obstetrics when documented was very good (93%). Of the three that did not match, one was a consultant-led delivery, one was a failed instrumental in theatre and there was one change from a Category one to a Category two.

The change in categories (n=2) and the reasons for these changes were well documented on both occasions.

Decision to Delivery Interval (DDI)

Category one n=7 average time: 22.85 minutes, range 14-43 minutes.

Category two n=41 average time: 41.3 minutes, range 11-96 minutes.

Regarding breach of recommended DDI, there was one delivery completed at 43 minutes with the indication cited as fetal distress. For category two deliveries, there were three that were outside the recommended DDI. One was delivered at 96 minutes from decision, with fetal distress as the indication. A DDI of 89 minutes was identified for a delivery indicated for previous caesarean section. Finally, a DDI of 88 minutes was identified for a delivery that had been downgraded from Category one to two, the indication for this delivery was fetal distress.

Neonatal and maternal outcomes were beyond the scope of this audit.

Discussion

The most frequently identified issue was poor documentation by both medical teams. This is a safety issue and highlights the importance of understanding categorisation in order to achieve safe delivery in optimum timing. Correct documentation is also central to good communication, an area often noted as needing improvement within Obstetrics.[1]

By correctly categorising and documenting this category, all members of the multidisciplinary team can be informed of the level of urgency and speed this delivery warrants.[1]

Although there was poor documentation of category, the majority of cases matched correctly between the two medical teams. This is reassuring as it identifies good verbal communication in emergency settings and reinforces that all members of the team were informed of degree of urgency and of the potential outcomes if there were delays. The introduction of electronic charts may provide a significant improvement in categorisation recording across medical disciplines and midwifery and this would be a useful audit for future audit cycle completion.

The decision to delivery intervals were excellent for both categories and are in line with European standards. The unit performed well with average DDI for Category one being 22 minutes and 41 minutes for Category two. This is reassuring and provides positive ground to build upon. As discussed by RCOG[1] and NICE[2], a DDI of 30 minutes for Category one and 30 to 75 minutes for Category two are reasonable targets and auditable standards for a unit. Although there were breaches of recommended DDI, on case review it is possible that two of the Category two deliveries would retrospectively be categorised as Category three. The knowledge garnered from this review reinforces that these targets are both reasonable and achievable. Inevitably, there will be clinical scenarios that require delivery sooner. In addition, all members of the multidisciplinary team must remember that 'undue haste' to reach a target can lead to poor outcomes from both maternal and neonatal perspectives.[1] It is important to note that NICE advise using the above DDI targets as 'audit standards only and not to judge multidisciplinary team performance for any individual caesarean section'.[2]

There has been debate regarding the 30 minute DDI for Category one caesarean section. Malaysian research suggests that 30 minutes is not an achievable target[6,7] however issues surrounding in-house obstetricians, access to theatre and lack of essential drugs were identified which are far less applicable in an Irish maternity unit setting. To contrast this, a Canadian paper showed that a DDI of 30 minutes is achievable. Their DDI target was achieved in 98% of cases and the median DDI was only 16 minutes.[6,8] These findings show the NICE targets are reasonable and this audit confirms this in an Irish peripheral unit.

The strength of this retrospective study lies in the thorough review of 48 cases. By identifying many variables including indications for emergency delivery, categorization and documentation as well as decision to delivery interval an overarching view of this maternity unit's performance at emergency caesarean section is highlighted. The limitation of the study relates to the smaller sample size which only provide a snapshot of a bigger picture in one unit. However, in reviewing the first 48 cases of 2018 a systematic approach was used to assess an important marker of clinical safety in maternity care.

This audit highlighted various aspects of communication and documentation that can be improved upon. Cavan General Hospital should continue to use this classification system and should continue to adopt an individualised approach to assessment of urgency for varying clinical scenarios.[1]

As highlighted by RCOG, good communication is key to good maternal and neonatal outcomes. All possible avenues to facilitate clear communication amongst the multi-disciplinary team should be explored and implemented, especially in the case of Category one delivery.[1] The practice of 'formal drill' is an excellent method to test this communication and allows for practical application of categorisation of caesarean section in an educational setting.[1] The effect of this simulation-based training across the multi-disciplinary team has been shown through various studies with the proportion of emergency caesareans sections being completed within 30 minutes increasing after educational simulation.[6,9,10]

Regarding future audit, there is scope to increase the sample size of cases reviewed. In addition, identifying the reasons for delayed DDI should be included. These reasons are relevant to varying degrees, depending on the level of service a unit can provide, and this has been highlighted in previous research.[6,7,8]

In conclusion, this retrospective study highlights the importance of categorisation of caesarean section and the need for improvement in how it is understood and used. Overall, the unit's performance is within European expectations. By building on the findings of this audit, education regarding categorisation, use of 'formal drill' and re-iterating the importance of documentation can lead to improvements in staff communication and ultimately both maternal and neonatal outcomes can be enhanced.

Declaration of Conflicts of Interest:

I, Dr. Jennifer Stokes hereby declare that this research titled Categorisation of Caesarean Section and Decision to Delivery Time in a Peripheral Maternity Unit is my own original work under the guidance of Dr. Salah Aziz at Cavan General Hospital. There are no conflicts of interest.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P464

Peri-operative and Pathologic Outcomes of Minimally Invasive Partial Nephrectomy (MIPN)

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Abstract

Aim

In this paper we assess the peri-operative, functional and early oncological outcomes of patients undergoing minimally invasive partial nephrectomy (MIPN) for the management of renal masses and investigate the influence of tumour complexity on these parameters.

Methods

We prospectively followed up all patients undergoing MIPN for the management of renal masses, by a fellowship-trained laparoscopic and robotic surgeon.

Results

One hundred and fifty patients were included (60.7% male); 64 underwent laparoscopic and 86 underwent robotic partial nephrectomy. Median age was 55.8±12.75 years.

Nephrometry Score was <6 in 37.2%, 7-9 in 55.4% and >9 in 7.4%.

Mean ischaemia-time was 24±1 minutes. There were 3 conversions to Open PN, and 8 to radical nephrectomy. Median bloods loss was 100mls (20–1600mls).

Tumour Stage was pT1a (68.7%), pT1b (14%), pT2a (0.67%), T3a (5.3%), benign/not applicable (10.6%). Five patients (3.3%) had positive margins.

Mean serum Creatinine (ng/ml) was 85.5±23 pre-op, 100.2±31.9 at 6 weeks and 94.2±25.1 at 3 months post-op.

Significant complications (>Clavien-Dindo 2) occurred in 7 patients. There was no association between nephrometry group (p=0.67) or stage (p=0.11) and complications.

Conclusion

In this series, we demonstrate that MIPN has excellent peri-operative and pathological outcomes, with a low overall complication rate.

Introduction

Partial nephrectomy has emerged as the treatment modality of choice for small renal masses, as it affords equivalent oncological outcomes to radical nephrectomy[1], while preserving greater renal function[2]. When performed using a minimally invasive approach (laparoscopically or robotically), improvements in post-operative pain, length of stay and blood loss can be achieved[3,4]. Both the EAU[5] and AUA[6] recommend MIPN as a treatment option for small renal tumours. We present our early experience with minimally invasive partial nephrectomy in 150 patients and aim to demonstrate the excellent peri-operative outcomes associated with this approach.

Materials and Methods

We prospectively followed up all patients undergoing MIPN for the management of renal masses, by a single fellowship-trained laparoscopic and robotic surgeon. All consecutive patients were included on an intention to treat basis.

Tumour complexity is expressed by RENAL nephrometry scores, calculated from pre-operative cross-sectional imaging (CT or MRI). RENAL scores of <6 were deemed Low Complexity, 7-9 Intermediate Complexity and >10 High Complexity. For patients with multiple tumours the nephrometry score of the most complex tumour is reported.

Renal function (Serum Creatinine and eGFR) and Haemoglobin (g/dl) were recorded pre-operatively and on Day one, Day two and three-months post operatively.

Surgery was performed across 4 centres, only 2 of which offered robotic surgery. As such, the choice of laparoscopy v robotics was not made by randomisation but rather by the operative modality which was available. Pre-operative work up, peri-operative care and post-discharge follow-up was identical for both operative modalities.

Robotic Surgery was performed using the Da Vinci Xi robot in a side-docked configuration with four robotic ports and a standard assistant port, while laparoscopic surgery routinely utilised three ports, with placement of an additional fourth port for liver retraction if required. All patients were placed in a lateral position with 45 degrees flexion centered on the umbilicus.

Most cases (93.3%) were performed via a transperitoneal approach, but in selected cases a retroperitoneal approach was utilized.

Depending on the tumour characteristics, a combination of off-clamp, segmental ischaemia and hilar clamping was utilized. Tumours were excised using a cold scissors, and an enucleation technique, followed by Sliding Clip renhorraphy using a continuous 3-0 V-Lock suture and Haemolock clips. Specimen extraction was through an extended port site incision.

A Ready-Vac drain was placed in the perinephric space, which was removed day one post-op if drain fluid creatinine measurement showed no evidence of urine leak.

Data was collected from patient medical notes, laboratory records and radiology databases, and compiled and analysed using Stata/IC 12.1 (StataCorp, 4905 Lakeway Dr, College Station, TX, USA 77845). Data collected was identical for each group and only data routinely collected in patient's peri-operative course was recorded. Results are presented as means and standard deviations, or medians and ranges. Mean comparison was performed using t-tests and categorical variable comparison using Chi-Squared or Fisher's Exact Tests. All reported p-values are 2-tailed.

Results

Demographics

One hundred and fifty consecutive patients were included in the study, 91 (60.7%) males and 59 (39.3%) females. Sixty-four patients underwent LPN (42.7%) and 86 underwent RAPN (57.3%). Mean age at time of surgery was 55.8 ± 12.75 years.

Demographics	**N (%)**
Sex	
• Male	91 (60.7%)
• Female	59 (39.3%)
Age (mean + SD)	55.8 ± 12.75 years
Operation (ITT)	
• Laparoscopic	64 (43.7%)
• Robotic	86 (57.3%)

Table 1: Demographic Details.

Tumour Characteristics

Nephrometry score was <6 in 56 patients (37.3%), 7-9 in 82 patients (54.7%) and >9 in 11 patients (7.3%). Nephrometry data was unavailable for one patient (0.7%). Fourteen tumours were hilar in location.

Pre-operative biopsy was performed in 50 patients (33.1%). Biopsy result was Clear Cell RCC (n=32), Papillary RCC (n=3), Cystic RCC (n=1), Chromophobe RCC (n=4), Oncocytoma (n=2), Oncocytic neoplasm/Chromophobe (n=1), , Inflammatory (n=1) and indeterminate (n=4). Biopsy histology was concordant with final histology for tumour type in 91.4%, and concordant for grade (where applicable) in 55.2%.

Operative Details

Actual procedure performed was partial nephrectomy (n=127), partial nephrectomy for multiple lesions (n=4), radical nephrectomy (n=8) and heminephrectomy (n=11). Three patients required conversion to open surgery due to difficulty with closure of renal defect post tumour resection (n=2) and toxic fat adherent to tumour and renal pelvis (n=1). One patient was converted from robotic partial nephrectomy to laparoscopic radical nephrectomy in order to obtain tactile sensation due to dense hilar reaction. Indications for conversion from partial to radical nephrectomy were adherent toxic fat (n=4), dense perihilar desmoplastic reaction (n=1), complex anatomy and adhesions (n=1) and retro-hilar location precluding safe excision and reconstruction (n=1).

A transperitoneal approach was employed in 140 (93.3%), retroperitoneal in 9 (6%) and 1 case (0.67%) was commenced retroperitoneal but converted to transperitoneal for technical reasons. Three patients (2%) had tumours excised from a solitary kidney.

One hundred and four patients (69.3%%) had a drain inserted, which was removed on Day 1 post-op in 78.8% (n=82) and Day two post-op in 11.5% (n=12).

Where vessel clamping was utilised, mean ischaemia time was 24.1 ± 8.2 minutes. Fifteen patients underwent zero-ischaemia surgery (10.5% of patients receiving PN), while 1 had selective vessel clamping.

Median blood loss was 100mls (Range: 20 – 1600mls). Blood transfusion was required in 6% (n=9).

Length of Stay

Median length of stay was three days (Range: 1-26) (Figure 1). Ten patients (6.67%) had prolonged admissions in excess of 7 days, due to open conversion (n=1), AV fistula requiring embolisation (n=1), decompensated pre-existing liver failure (n=1), urinoma and iatrogenic PUJ obstruction (n=1), urine leak requiring stent (n=1) ileus and prolonged atelectasis (n=2), new diagnosis of brain metastases (n=1) and severe respiratory failure requiring ICU support (n=1). (Table 1).

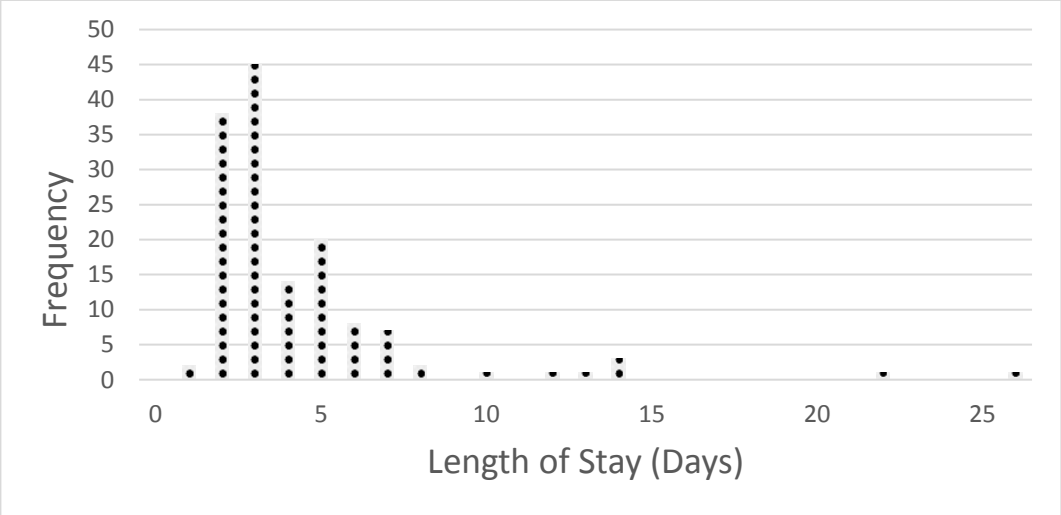

Figure 1: Distribution Dot Plot of Length of Stay.

Complications

Complications occurred in 46 patients (30.7%). Grade of complications using the Clavien-Dindo Classification was Grade 1 (n=4), Grade 2 (n=37), Grade 3b (n=6) and Grade 4 (n=1). There were no Grade 3a or Grade 5 complications. Overall rate of significant complications (>Clavien-Dindo 2) was 4.67%. Procedures required for those with Grade 3b complications were embolization of AV fistula (n=1), open insertion of drain for ascites due to decompensated liver failure (n=1), cardioversion for atrial fibrillation (n=1), re=exploration for bleeding and completion nephrectomy (n=1), JJ Stent insertion for urinoma (n=1) and rendez-vous procedure for iatrogenic PUJ obstruction (n=1). One patient required admission to the intensive care unit (Clavien-Dindo 4) owing to pneumonia, pleural effusion and respiratory failure. He recovered well and was discharged home on day 26.

Complications were noted more frequently in patients in the High Nephrometry Score group (45%) than in the Low (32.7%) and Intermediate (27.5%) groups (p=0.01).

Histological Findings

Mean tumour size was 32 ± 15.2mm. Histology demonstrated Clear Cell RCC (n=102), Papillary RCC (n=11) , Chromophobe RCC (n= 7), Oncocytoma (n=10), Cystic RCC (n=5), RCC not otherwise specified (n=1), RCC Unclassified (n=2), Angiomyolipoma (n=4), MEST (n=2), Multilocular Cystic Neoplasm of Low Malignant Potential (n=2), Metanephric Adenoma (n=1), Mucinous Tubular and Spindle Cell Tumour (n=1), Benign Cyst (n=1) and inflammation/sclerosis (n=1). (Table 2).

Histology	**N**	**%**
Clear Cell	102	68%
Papillary	11	7.33%
Chromophobe	7	4.67%
Oncocytoma	10	6.67%
Angiomyolipoma	4	2.67%
Other	16	10.67%

Table 2: Tumour Histology from resected specimen.

Five patients (3.3%) had positive margins.

Tumour Stage was pT1a (n=103, 68.7%), pT1b (n=21, 14%), pT2a (n=1, 0.67%), T3a (n=8, 5.3%) and benign/not applicable (n=16, 10.6%). Stage data was unavailable for one patient (0.67%). Positive surgical margins occurred in 5 patients (3.3%) (one focal), all of whom underwent robotic surgery. None of these patients with positive margins have had either local or distant recurrence to date.

Haematologic and Renal Function Outcomes

Mean serum Creatinine (ng/ml) was 85.5 ± 23 pre-op, 107.1 ± 29.6 Day 1, 109.2 ± 36.0 Day 2, 100.2 ± 31.9 at 6 weeks post op and 94.2 ± 25.1 at 3 months post op. There was a statistically significant difference between serum creatinine pre-operatively and at all follow up time points post op ($p<0.0001$ Day 1 and Day 2 post op, $p=0.029$ at 2-6 weeks, $p=0.0013$ at 3-6 months) .

Mean Haemoglobin (g/dl) was 13.8 ± 1.6 pre-op, 12.2 ±1.4 Day 1, 11.8 ± 1.4 Day 2, and 13.3 ± 1.6 at 3 months post op.

Comparison of Laparoscopic vs Robotic PN

We identified no significant differences between the laparoscopic and robotic approach, in terms of tumour nephrometry group ($p= 0.365$), ischaemia times ($p=0.98$), length of stay ($p=0.71$) or incidence of complications ($p=0.56$) (Table 3). There was no statistical difference in serum Creatinine pre-operatively or at any time period post op, although there was a trend towards lower levels at 3-6 months in the robotic group (87.8 v 100.4ng/ml, $p=0.06$). We did identify a statistical reduction in blood loss in the robotic group (210.5 ± 260.4mls v 276.5 ± 313.33mls, $p=0.037$), but no difference in transfusion rates ($p=0.3$).

Variable	**Laparoscopic**	**Robotic**	**P-Value**
Ischaemia Time (mins)	24.2 ± 8.2	24.1 ± 0.96	*0.98*
Complications	18/64 (28.1%)	28/86 (32.5%)	*0.56*
Mean Length of Stay	4.3 ± 3.7	4.1 ± 3.1	*0.71*
Blood Loss (mls)	276.5 ± 313.33	210.5 ± 260.4	*0.038*
Blood Transfusion	2/64 (3.1%)	7/86 (8.1%)	*0.3*

Table 3: Comparison of Laparoscopic and Robotic Surgery.

Discussion

The guiding principle of nephron sparing surgery is the ability to achieve equivalent oncologic control to radical nephrectomy for patients with renal tumours[1], while maintaining the maximum possible renal function, through preservation of nephron mass[2]. Central to this is the recognition that renal dysfunction is an independent risk factor for cardiovascular disease and death[7]. What remains to be clearly elucidated however, is whether surgically created chronic kidney disease (CKD) (ie. eGFR decline following nephrectomy), carries the same overall health risk as CKD from chronic medical disease, and whether nephron sparing surgery confers an overall survival benefit over radical nephrectomy[1].

Both the EAU[5] and AUA[6] advocate partial nephrectomy as a treatment option for T1 tumours, based on the current AJCC staging system.

However, the complexity of nephron sparing surgery is not solely based on the size of the mass to be excised, but rather on a number of tumour characteristics, including distance from the collecting system, polarity and whether it is endo or exophytic. These features are quantified using nephrometry scores, such as the RENAL[8] or Padua Scores[9], which have been shown to predict peri-operative outcomes including ischaemia times[10,11], conversion to radical nephrectomy[10] and incidence of high grade complications[11,12].

Partial nephrectomy also carries a number of imperative indications, including bilateral renal masses and tumours in solitary kidneys.

Laparoscopic partial nephrectomy has been shown to achieve equivalent oncologic outcomes as open partial nephrectomy, while achieving a shorter operative time, shorter length of stay and lower blood loss[3]. There was however an increase in ischaemia times and overall complication rates with the laparoscopic approach.

When compared to open PN, robotic PN results in lower complication rates, blood loss and length of stay, with similar operative time, warm ischaemia time, change in creatinine and rates of positive surgical margins[4].

Robotic PN is associated with similar operative time, blood loss, positive margins and complication rates to laparoscopic PN, while affording lower rates of conversion to open or radical surgery, shorter ischaemia times and shorter length of stay[13]. Owing to the increased dexterity offered it may permit surgeons to take on tumours of higher complexity than the standard laparoscopic approach.

Our data demonstrate excellent peri-operative outcomes, with low blood loss and transfusion rates, as well as short length of stay, in line with those reported in the international literature, and summarised in the meta-analysis by Choi et al[13]. Length of stay data in out series is skewed by a small number of outliers who required prolonged admissions owing to medical co-morbidities (Figure 1).

While the overall complication rate initially appears high at 32.8%, 85% of these were minor Grade one and two complications. A large proportion of these patients suffered from atelectasis and post-operative respiratory infection related to the procedure. Our rate of significant complications (Clavien-Dindo Grade 3 and above) at 4.6% compares favourably with those studies analysed by Choi et al (Range 2-12.2%, Pooled 6.86%)[13].

While we observed a statistical increase in mean serum creatinine at 3-6 month follow up compared to pre-op levels (85 ± 22.5 v 94 ± 55.4,p =0.013), this is not considered to be of clinical consequence.

We did not identify any association between length of stay or complications and tumour complexity or stage.

Owing to the short follow up of this cohort, we are presenting only peri-operative data, with margin status serving as a surrogate of oncologic control. While this has not been shown to predict recurrence for low risk disease (HR 0.62, p=0.64), Shah et al demonstrated an increased risk in those with high risk disease (>T2 or Fuhrman Grade 3 and 4) (HR 7.48, p<0.001)[14]. The same authors reported positive margin rates of 7.8% in their cohort[14], which is higher than we report in this series (3.3%). We acknowledge higher rates of positive margins in the robotic group (5.8% v 0%), but attribute this to taking on higher complexity cases robotically than would have been attempted laparoscopically.

While this study was not formally randomized, operative modality was selected based on that which was available in the unit at the time, rather than on patient or tumour factors. As such we expect bias to be minimal with regard to modality. We acknowledge the short duration of follow-up as a limitation of this paper, but plan to follow-up these patients and examine medium and long-term oncologic and functional outcomes.

In conclusion, we advocate minimally invasive PN as a safe and effective management strategy for the management of selected renal masses, whether performed by a laparoscopic or robotic approach. It affords excellent oncologic outcomes, as well as short length of stay, low blood loss and minimal deterioration in renal function. The choice of LPN versus RAPN should be made based on local availability and expertise, with largely equivalent functional outcomes achievable with each approach. Nephrometry scores may be helpful in identification of patients in whom the operative risks and probability of conversion to RN are high, to facilitate informed counselling and decision making.

Declaration of Conflicts of Interest:
The authors confirm that there are no conflicts of interest to be declared.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P465

In-Hospital Cardiac Arrests: A study of Incidence and Outcomes

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Abstract

Introduction

In-hospital cardiac arrest (IHCA) is a sentinel event for patients. Recent studies report the survival rate to be between 1.5 and 10.4 per 1000 patients/year. We aim to determine the incidence of IHCA in a tertiary Irish hospital in 2019 and examine outcomes following IHCA.

Methods

Data was collected on IHCAs using the electronic patient record (EPR) software. Descriptive statistics were used to describe patient characteristics and variables of each IHCA. The Chi-squared test, Fisher Exact test and unpaired Student's t-test were used to assess significance.

Results

The arrest code was activated 226 times. One hundred and nineteen patients (58%) met the criteria for IHCA. The incidence of IHCA was 5.1 per 1000 patients/year. Survival to discharge was 32.8% (N=39). The first rhythm was shockable in 39.5% of cases (N=47) with 48.9% (N=23) surviving until discharge. Fifty arrests (42%) occurred on ward level. There was a significant survival benefit seen with IHCAs occurring outside of ward level and those with an initial shockable rhythm ($p<0.05$).

Conclusion

This hospital is a large center for primary percutaneous coronary intervention. This may account for the higher incidence of shockable rhythms and thus higher survival rates. Monitoring of trends of IHCA incidence and outcomes is important for future planning, resource allocation and training provision.

Introduction

A cardiac arrest is defined by the Utstein criteria as the cessation of cardiac mechanical activity, which is confirmed by the absence of a palpable pulse, unresponsiveness and apnoea (or agonal respiratory attempts).[1] An 'in-hospital arrest', as per the Utstein criteria, is one that occurs in a hospitalised patient who had a pulse at the time of admission.[1]

There is a shortage of studies on in-hospital cardiac arrest (IHCA) in Ireland and there is currently no national registry. A study carried out in Cork University Hospital (CUH) in 2011 reported 63 IHCAs over a 1-year period, an incidence of 1.5 per 1000 patients/year.[2] This is in keeping with findings from the UK National Cardiac Arrest Audit, where an overall incidence of 1.6 per 1000 hospital admissions was reported.[3] Survival to discharge was 27% for patients in CUH and survival was worse for IHCAs occurring at ward level. 30.2% of arrests were shockable.[2] The UK data showed that 18.4% of patients suffering IHCA survived until discharge.[3]

Fennelly et al reported a higher incidence of 10.4 per 1000 patients/year in Beaumont Hospital from 2010-2013, of which 15.6% were shockable.[4] Overall, 18.4% survived until discharge. A significant association was identified between return of spontaneous circulation and shockable IHCAs (versus non-shockable). Again, arrests occurring at ward level were associated with reduced survival.

In the United States, between the years of 2008 and 2017, the incidence of IHCA is reported as 9.7 per 1000 hospitalisations.[5] The survival to rate in 2016 was 25.8%. On an international level, reported survival to discharge varies between 0% and 42%, with larger studies reporting a figure of approximately 20%.[1]

This study was carried out in St James's Hospital, a large university teaching hospital and a primary percutaneous coronary intervention (PCI) center. St James's Hospital preforms 25.8% of primary PCI cases in the Republic Ireland, the highest proportional nationally.[6]

A cardiac arrest alert is activated in St. James's Hospital by calling through to the hospital switchboard. The cardiac arrest team is alerted and attends promptly. During normal working hours the cardiac arrest team in St James's Hospital comprises of a cardiology registrar, cardiology senior house officer, cardiology intern, anesthetics registrar, resuscitation officer and cardiac care nurse. Outside of normal working hours a medical registrar, medical senior house officer and medical intern replace their cardiology counterparts. The resuscitation officer is replaced by the site nurse manager outside of working hours.

In this study we aim to determine the incidence and outcomes of IHCA in St. James's Hospital in 2019 and compare this to national and international figures. We aim to identify characteristics of IHCA that are associated with improved survival to discharge.

Methods

A record is made each time the cardiac arrest alert is activated via the hospital switchboard. This data was used as a starting point and the Electronic Patient Record (EPR) hospital computer software was accessed to consolidate this data. Information was gathered on baseline patient demographics, characteristics of IHCA and outcomes following IHCA.
The Utstein criteria were used to define IHCA. We excluded all incidences when the arrest code was activated for reasons other than IHCA. The Charlson Comorbidity Index (CCI) is used to describe the comorbidities of the patient population. Categorical variables are presented as percentages and continuous variables are presented as mean (+/- standard deviation). The Chi-squared test, Fisher Exact test and the unpaired Student's t test were used to determine clinical significance and a 2 tailed p value of <0.05 was deemed significant. Data collection and statistical analysis was performed using Microsoft Excel software.

Results

2019 saw in excess of 23,000 inpatient admissions, 300,000 outpatient attendances and 50,000 emergency department attendances to the hospital. During this period the cardiac arrest code was activated on 226 occasions. One hundred and nineteen events met the criteria for IHCA, an incidence of 5.1 per 1000 patients/year. For instances other than IHCA, the arrest code was activated most often for syncope, seizure, hypotension, airway compromise and desaturation.

Patient and arrest characteristics for the 119 episodes of IHCA are displayed in Table 1. Associations of characteristics with survival to discharge are displayed in Table 2.

Mean age at time of IHCA was 79.8 years (+/- 12.5). Seventy-nine patients were male (66.4%). The survival rate was 56.3% at 24 hours (N=67). Thirty-nine patients survived until discharge (32.8%). There was no significant association between age and survival until discharge ($p=0.13$). However, there was a trend towards improved survival in patients < 70 years of age. Females were more likely to survive until discharge (55.6% versus 30.4%, $p=0.02$).

The most common location for IHCA was on ward level (42%, N=50). This includes both medical and surgical wards. Arrests occurring on ward level were associated with a significantly worse survival to discharge when compared to other locations in the hospital (14% versus 46.4%, $p<0.001$).

The majority of IHCAs (70.6%) occurred outside of normal working hours (defined as between 09:00 and 17:00 on weekdays). There was no statistically significant difference in terms of survival to discharge between IHCAs occurring inside and outside of normal working hours (p=0.36).

Forty-eight patients were under the care of the cardiology team at the time of IHCA (40.3%). Surgical teams were caring for the patients in 23.5% of cases (N=28) and medical teams (other than cardiology) in 33.6% (N=40) of cases.

The first documented rhythm was shockable in 39.5% of cases (N=47) and of those, 48.9% (N=23) survived until discharge. This is compared to a 23.4% (N=15) survival rate when the first documented rhythm was non-shockable ($p<0.05$).

The most common discharge destination was home (56.4% of survivors, N=22). Twelve patients were transferred to another hospital (30.8%). In many of these cases patients were transferred to their local hospital post undergoing primary PCI in this center. The remainder were discharged to a long-term care facility (12.8%, N=5).

Patient comorbidities are listed in Table 3. Mean CCI scores for the patient groups are shown in Table 4. The most common comorbidity was myocardial infarction (54.6% of total patients, N=65). This was more common in men than women and more common in patients who survived until discharge (61%, N=24). Of the patients who did not survive until discharge, 11.3% had a metastatic solid tumor. Only 1 patient with a metastatic solid tumor survived until discharge after IHCA. There was no significant association between individual comorbidities and survival to discharge. Survivors of IHCA had a lower total CCI score when compared to patients who did not survive (4.9 vs 6.1, p=0.020685312).

Other common comorbidities in the patient population included congestive heart failure (42%, N=50), localized solid tumor (21%, N=26), cerebrovascular accident/transient ischemic attack (18.5%, N=22), moderate to severe chronic kidney disease (17.6%, N=21), uncomplicated diabetes (12.6%, N=15), chronic obstructive pulmonary disease (10.9%, N=13) and peripheral vascular disease (10.9%, N=13).

Characteristic	Number of patients (% of total)	Characteristic	Number of patients (% of total)
Gender:		Rhythm:	
Male	79 (66.4%)	Shockable	47 (39.5%)
Female	40 (33.6%)	Non-shockable	64 (53.8%)
		Unknown	8 (6.7%)
Age:			
Mean (+/- SD)	79.8 years (+/- 12.5)	Survival at arrest:	
Median	74 years	Yes	73 (61.3%)
		No	46 (38.7%)
Timing:			
Working hours	31 (26.1%)	Survival at 24 hours:	
Outside of working hours	84 (70.6%)	Yes	67 (56.3%)
Unknown	4 (3.4%)	No	52 (43.7%)
Location:		Survival to discharge:	
Ward	50 (42%)	Yes	39 (32.8%)
ICU	20 (16.8%)	No	80 (67.2%)
CCU	15 (12.6%)		
Cardiac Catheterisation Lab	21 (17.6%)	Discharge destination:	
Other	13 (10.9%)	Home	22 (56.4%)
		Another hospital	12 (30.8%)
Treating team:		Long-term care	5 (12.8%)
Cardiology	48 (40.3%)		
Medical	40 (33.6%)		
Surgical	28 (23.5%)		
Other	3 (2.5%)		

Table 1: Patient and IHCA characteristics.

Characteristic	Number of patients surviving to discharge (% of total)	P value
Age:		
<70 years	19 (39.6%)	0.14
≥70 years	19 (26.8%)	
Gender:		
Male	24 (30.4%)	0.019188
Female	15 (55.6%)	
Time of arrest:		
Working hours	12 (38.7%)	0.362055
Outside of working hours	25 (29.8%)	
Location of arrest:		
Ward	7 (14%)	<0.001
Locations other than ward	32 (46.4%)	
Rhythm:		
Shockable	23 (48.9%)	0.005
Non-shockable	15 (23.4%)	

Table 2: Associations of patient and IHCA characteristics with survival to discharge.

Comorbidity	All patients (% of total)	Males (% of total)	Females (% of total)	Patients surviving to discharge (% of total)	Patients not surviving to discharge (% of total)	Association of CCI variable with survival to discharge (P value)
Myocardial infarction	65 (54.6%)	48 (60.8%)	17 (42.5%)	24 (61.5%)	41 (51.3%)	0.289987
Congestive heart failure	50 (42%)	33 (41.8%)	17 (42.5%)	16 (41%)	34 (42.5%)	0.878439
Peripheral vascular disease	13 (10.9%)	12 (15.2%)	1 (2.5%)	2 (5.1%)	11 (13.8%)	0.157004
Cerebrovascular accident/transient ischemic attack	22 (18.5%)	13 (16.5%)	9 (22.5%)	4 (10.3%)	18 (22.5%)	0.106319
Dementia	8 (6.7%)	6 (7.6%)	2 (5%)	1 (2.6%)	7 (8.8%)	0.205917
Chronic obstructive pulmonary disease	13 (10.9%)	8 (10.1%)	5 (12.5%)	4 (10.3%)	9 (11.3%)	0.870446
Connective tissue disease	5 (4.2%)	0	5 (12.5%)	1 (2.6%)	4 (5%)	0.534147
Peptic ulcer disease	2 (1.7%)	0	2 (5%)	0	2 (2.5%)	1
Liver disease (mild)	5 (4.2%)	5 (6.3%)	0	2 (5.1%)	3 (3.8%)	0 .72503
Liver disease (moderate to severe)	1 (0.8%)	1 (1.3%)	0	0	0	1
Diabetes (uncomplicated)	15 (12.6%)	12 (15.2%)	3 (7.5%)	4 (10.3%)	11 (13.8%)	0.589911
Diabetes (end-organ damage)	9 (7.6%)	6 (7.6%)	3 (7.5%)	3 (7.7%)	6 (7.5%)	0.970292
Hemiplegia	2 (1.7%)	1 (1.3%)	1 (2.5%)	0	2 (2.5%)	1
Chronic kidney disease (moderate to severe)	21 (17.6%)	19 (24.1%)	2 (5%)	5 (12.8%)	16 (20%)	0.334885
Solid tumor (localized)	26 (21%)	17 (21.5%)	9 (22.5%)	10 (25.6%)	16 (20%)	0.484548
Solid tumor (metastatic)	10 (8.4%)	3 (3.8%)	7 (17.5%)	1 (2.6%)	9 (11.3%)	0.108919
Leukemia	1 (0.8%)	1 (1.3%)	0	0	1 (1.3%)	1
Lymphoma	2 (1.7%)	1 (1.3%)	1 (2.5%)	1 (2.6%)	1 (1.3%)	0.600664
AIDS	0	0	0	0	0	1

Table 3: CCI variables in patient groups and association of CCI variables with survival to discharge.

	All patients	Males	Females	Patients surviving to discharge	Patients not surviving to discharge	P value (patients who survived to discharge vs patients who did not)
Mean CCI score (+/-standard deviation)	5.8 (+/-2.7)	5.7 (+/-2.7)	5.9 (+/-2.6)	4.9 (+/-2.5)	6.1 (+/-2.7)	
						0.020685312

Table 4: Mean CCI score in patient groups.

Discussion

We report an IHCA incidence of 5.1 per 1000 patients/year. This is higher than the incidence reported in Cork University Hospital in 2011 and that reported by the UK National Cardiac Arrest Audit.[2, 3] It is less than half of the incidence reported by Beaumont Hospital in 2010-2013 (10.4 per 1000 patients/year).[4] Shockable rhythms accounted for a larger proportion of arrests (39.5%) and the survival to discharge rate (32.8%) was notably higher than that reported in similar studies.

The higher incidence of shockable rhythms may be in part explained by the high volume of ST elevation myocardial infarctions (STEMI) treated with primary PCI in this hospital. The greater proportion of shockable rhythms is the likely explanation for the higher-than-expected survival rate.

A higher rate of survival to discharge was seen with female patients. The significance of this finding should be interpreted with caution given that the patient numbers in this study are small (40 female patients, 15 of whom survived until discharge). Many studies have failed to show that gender influences survival to discharge.[1] However, other studies such as that by Herlitz et al.[7] have shown female gender to be an independent predictor for survival to discharge.

Ofoma et al.[8] have demonstrated in a previous study of US patients that survival was significantly lower in patients who arrested during off-hours compared with on-hours (16.8% vs. 20.6%; $p < 0.0001$). Although survival in both groups improved over time (the study period was between 2000 and 2014), the survival difference persisted between the groups. In our study, there was no difference in survival between IHCAs occurring during and outside of normal working hours. This is reassuring and suggests a consistent standard of training in resuscitation techniques across the board for junior medical doctors.

In line with other studies, survival was worse for IHCAs occurring on the medical and surgical wards.[2, 4] This was the most frequent location for IHCA (42%). This suggests that additional systems need to be put in place to allow for the early detection of clinical deterioration on the ward level. When appropriate, high-risk patients can then be transferred to a more suitable clinical setting with more intensive monitoring.

In our study, in 47.3% of cases, the cardiac arrest code was activated for reasons other than cardiac arrest. This suggests a protentional role for a medical emergency team (MET), that could be called upon in the case of a clinically deteriorating patient, not meeting the criteria for IHCA. A MET team typically consists of medical and nursing staff from the intensive care and general medical teams. Studies on the effectiveness of MET teams have shown promising results.[1]

Following the introduction of a MET system in a tertiary referral hospital, Bellomo et al.[9] reported a relative risk reduction of 65% in the incidence of IHCA, 55% in death following cardiac arrest and 88% in overall in-hospital mortality. In the UK, the Aintree University Hospitals Trust implemented this system and reported a sustained 33% decrease in cardiac arrest calls as a result. In addition, there was a reduction of >50% of clinical incidents relating to failure to manage acute deterioration.[10]

From an Irish perspective, an Emergency Response System was implemented in Tallaght University Hospital in 2012. An audit in 2014 showed a 21% decrease in the number of IHCA calls in a one-year period. Of the patients who triggered an Emergency Response Team call, 63% were discharged home, 31% did not survive to discharge and 6% were still inpatients at the end of the study period.[11]

However, the majority of studies on METs have not been double-blinded or placebo-controlled. This must be taken into account when interpreting the results. The positive results may partly be explained by an increase in the number of not-for-resuscitation orders and the education of staff on the ward that is typical prior to the introduction of a MET.[1, 12, 13] When Hillman et al.[14] randomised 23 hospitals in Australia to continue functioning as usual or to introduce a MET system, they found no significant difference in the incidence of IHCA, unplanned intensive care unit (ICU) admissions or unexpected deaths between the groups.

Improvements in the standard of living and advances in healthcare has resulted in people living for longer.[15] The population of Ireland is aging and the prevalence of frailty increases with age. Frailty places older adults at risk of hospitalization with longer duration of hospital stays. It is therefore likely that the number of IHCAs will increase in line with this. Holmberg et al estimated a 23% increase in the annual incidence of IHCA in the United States from 2008 (268200 cases) to 2017 (328700 cases).[5] The health system in Ireland needs to be prepared for the public health burden from IHCA that we can expect in the coming years.

Older age is also associated with worse survival following IHCA. A Swedish study of more than 11,000 patients found that the thirty-day survival rate was 28% for patients aged 70–79 years, 20% for patients aged 80–89 years, and 14% for patients aged ≥90 years.[16] Differences in cut-off values for age leads to difficulty in making comparisons between studies. Age above and below 70 years has been used as a cut off value in multiple studies.[17-19] Although there was no significant association between age and survival to discharge in our study, there was a trend towards improved survival in patients < 70 years of age.

It is important that up-to-date statistics on incidence and outcomes of IHCA are available when informing patients and family members about likely prognosis should IHCA occur. It can inform decision making on resuscitation status and avoid inappropriate ICU admissions. It is also imperative to guide allocation of hospital resources. This includes the Basic Life Support and Advanced Cardiac Life Support training programmes and the provision of intensive care beds within the hospital.

In 2016 Sinha et al.[20] reported a striking lack of randomised control trials on treatments for IHCA. In order to improve outcomes, more research needs to be carried out in this area.

We acknowledge that not all episodes of IHCA result in activation of the arrest code, in particular IHCAs that occur in the cardiac catheterisation lab or in the ICU. In these cases, there is often sufficient trained personnel present who can manage the arrest without the need for additional support. For this reason, the incidence of IHCA may be greater than reported.

As data was collected retrospectively for this study, not all data points could not be obtained for each episode of IHCA. Missing data accounts for <1% of the total data points.

Declaration of Conflicts of Interest:
No conflicts of interest to declare.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P466

Covid Concerns: A Radiological Perspective

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Abstract

Aims

The aim of this study was to assess and quantify current staff attitudes and experiences of the Covid-19 pandemic in relation to training, research, education, patient care and staff morale.

Methods

An anonymised survey was carried out across the radiology departments of two university teaching hospitals over a 10-day period in December 2020.

Results

There was a total of 90 participants and 73% (66/90), 69% (62/90) and 86% (77/90) of participants either agreed or strongly agreed that the pandemic is having a negative effect on training, research and continued professional development respectively. A total of 63% (57/90) of participants either agreed or strongly agreed that the pandemic is having a negative effect on patient care and 88% (79/90) of participants either agreed or strongly agreed that the pandemic is having a negative effect on staff morale.

Conclusion

The Covid-19 pandemic has and continues to pose enormous challenges for the delivery of patient care, training, education and staff well-being with various novel and innovative solutions available to healthcare managers and providers.

Introduction

The World Health Organization (WHO) declared the Covid-19 global pandemic on March 11, 2020, and at the time of writing (20:31, 10/01/2021) there are a total number of 90,005,787 cases of Covid-19 worldwide and 1,931,382 recorded deaths [1, 2]. This international health crisis has and continues to pose enormous challenges resulting in profound adjustments and transformation in the delivery of health care, training and education [3-5].

Numerous specialities have shifted towards a virtualised model of patient assessment and management to insure a safe and continued high standard of care with multidisciplinary team (MDT) discussion moving to online-based platforms [3, 6]. The need for physical distancing to reduce infection transmission rates coupled with the redeployment of health care workers to areas of more crucial need has resulted in significant staffing, training and teaching concerns [7-9]. Furthermore, the cancellation and / or postponement of medical conferences and examinations have necessitated education providers to adapt quickly and modify their delivery of content and evaluation to web-based modalities [10, 11].

The pandemic also presents substantial psychological impacts for healthcare workers and research following the SARS epidemic highlighted the two key areas of social isolation (due to physical distancing and infection control) and lack of support (due to reduced interaction with family and friends) as being major contributors, both of which have been particularly heightened in the current circumstances [12].

The aim of this study is to assess and quantify current staff attitudes and experiences of the Covid-19 pandemic in relation to training, research, education, patient care and staff morale. In doing so the authors seek to identify any trend or outcomes that may be useful for healthcare managers, policy makers and training bodies with regard to future planning, provision of services and training.

Methods

The authors invited radiology staff members (radiographers, nurses, consultant radiologists, radiology specialist registrars) from two university teaching hospitals to undertake a voluntary anonymised survey during a 10-day period from 13/12/2020 to 23/12/2020. The survey was a Likert-scale based anonymous questionnaire which is an extensively utilised, recognised and validated means of scientifically measuring attitudes [13, 14]. The survey captured the basic demographics of gender and discipline and contained 5 questions regarding the effect of the pandemic on training, research, continued professional development, patient care and staff morale. Approval was granted by the local Research Ethics Committee prior to commencement and all data was password protected and processed using Microsoft Excel.

Results

A total of 92 participants took part in the survey. Of these, two surveys were incomplete leaving a total of 90 participants included in the final analysis. There were 64 female and 26 male participants, and the discipline breakdown was as follows: 19 consultant radiologists; 11 nurses; 47 radiographers; 13 radiology specialist registrars.

A total of 73% (66/90) of participants either agreed or strongly agreed that the pandemic is having a negative effect on training, with 16% (14/90) stating they either disagreed or strongly disagreed and 11% (10/90) stating they neither agreed nor disagreed (Figure 1).

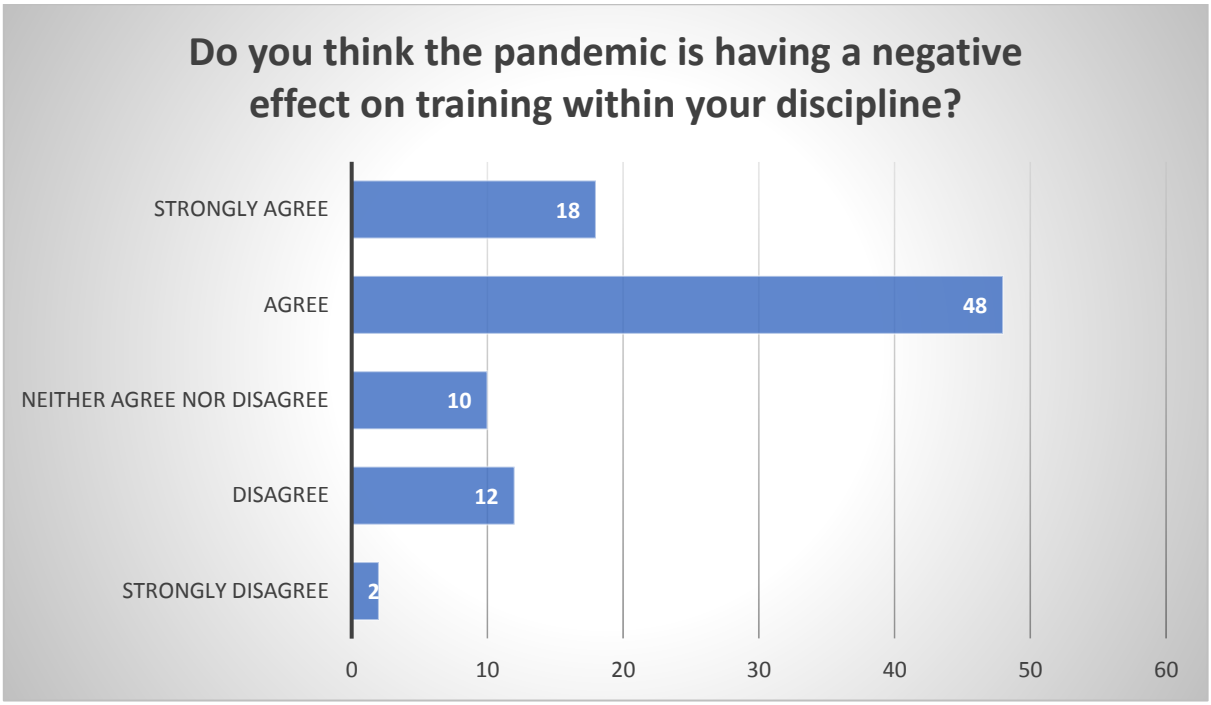

Figure 1: Participant response to question – Do you think the pandemic is having a negative effect on training in your discipline?

In relation to research, 69% (62/90) of participants either agreed or strongly agreed that the pandemic is having a negative effect on research, with 9% (8/90) stating they disagreed and 22% (20/90) stating they neither agreed nor disagreed (Figure 2).

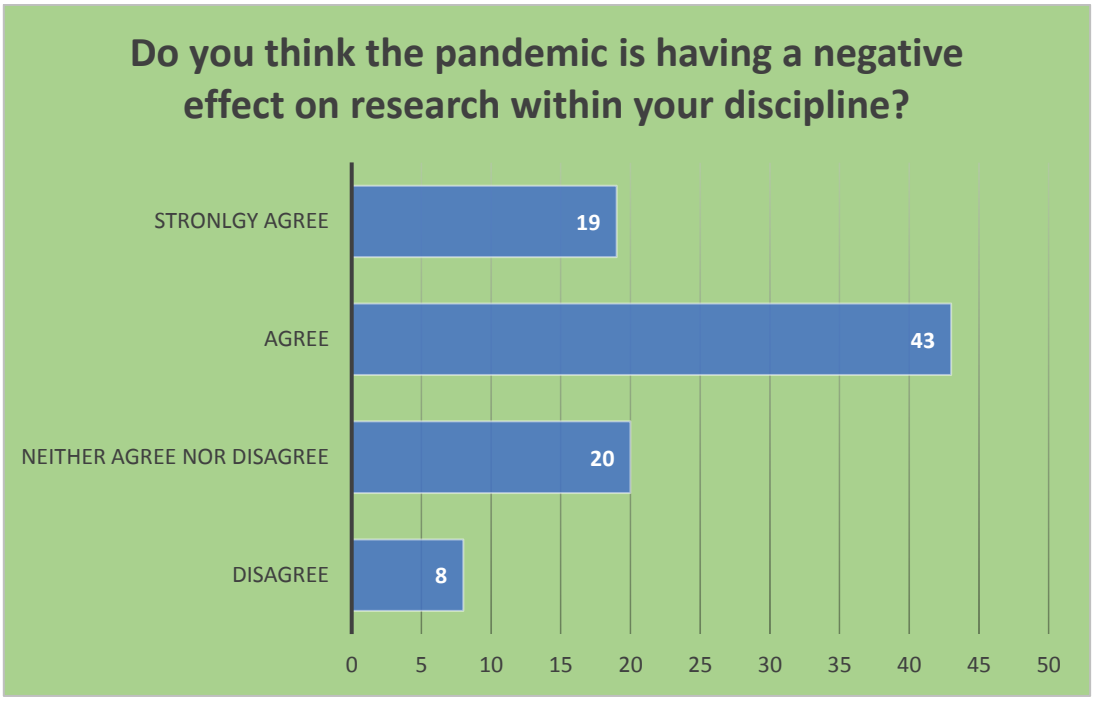

Figure 2: Participant response to question – Do you think the pandemic is having a negative effect on research in your discipline?

Regarding continued professional development, 86% (77/90) of participants either agreed or strongly agreed that the pandemic is having a negative effect on continued professional development, with 9% (8/90) stating they disagreed and 5% (5/90) stating they neither agreed nor disagreed (Figure 3).

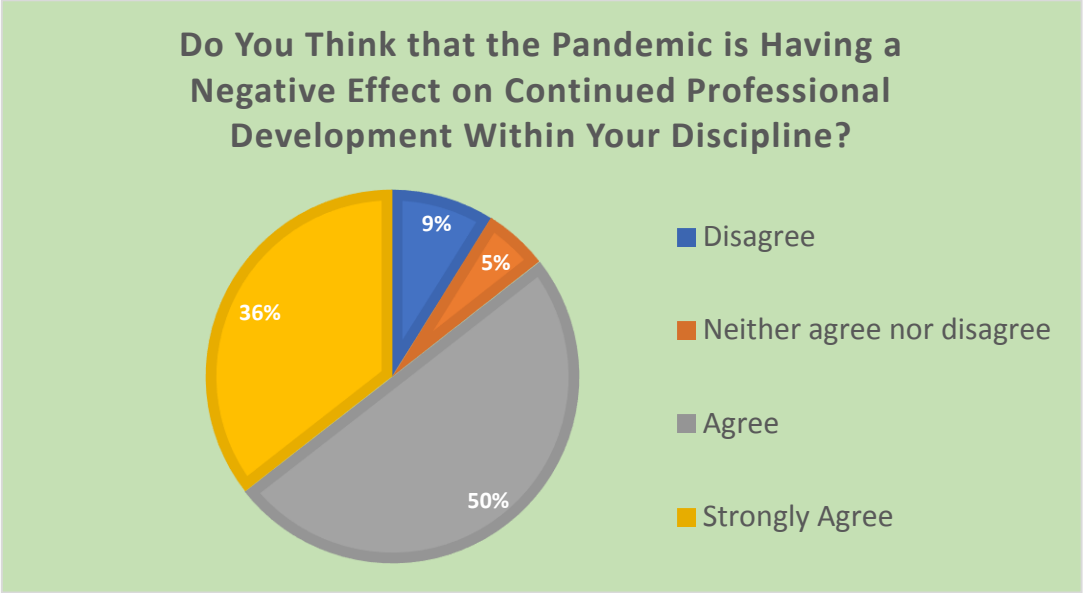

Figure 3: Participant response to question – Do you think the pandemic is having a negative effect on continued professional development in your discipline?

A total of 63% (57/90) of participants either agreed or strongly agreed that the pandemic is having a negative effect on patient care, with 27% (24/90) stating they either disagreed or strongly disagreed and 10% (9/90) stating they neither agreed nor disagreed (Figure 4).

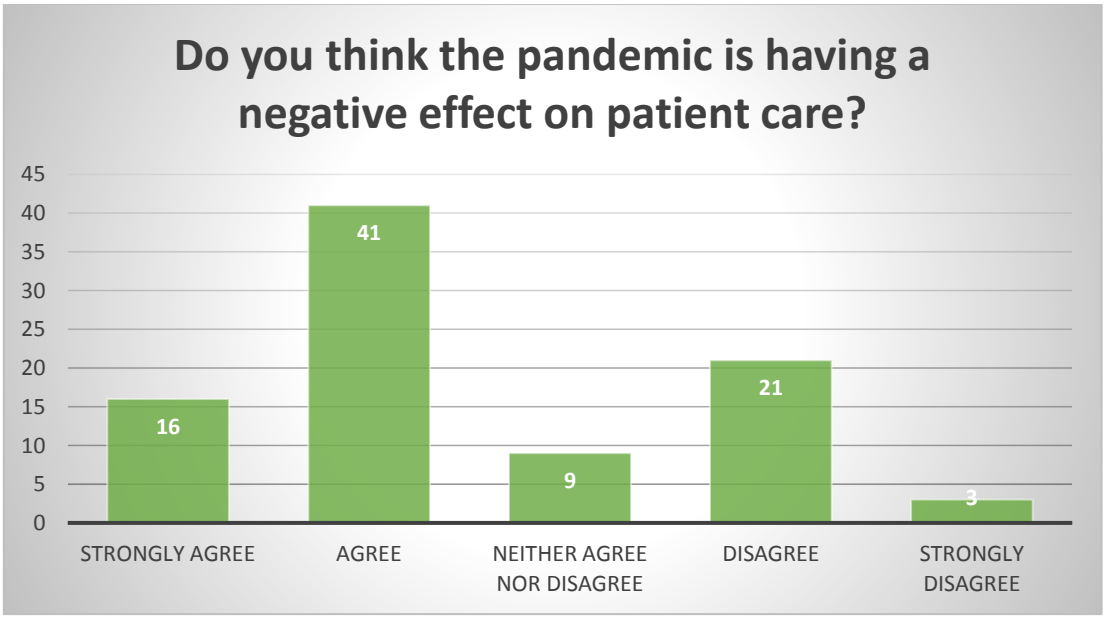

Figure 4: Participant response to question – Do you think the pandemic is having a negative effect on patient care?

As to staff morale, 88% (79/90) of participants either agreed or strongly agreed that the pandemic is having a negative effect on staff morale, with 8% (7/90) stating they disagreed and 4% (4/90) stating they neither agreed nor disagreed (Figure 7).

Discussion

At the time of writing, Ireland is experiencing a significant "third wave" with a full national "lockdown" currently in place and the Covid-19 pandemic continues to present major obstacles to the delivery of health care and to the normal workings of society at large. The central ethos of all health services is the provision of safe, adequate care for all patients and data from previous epidemics has revealed that when health systems become overwhelmed the indirect mortality rate from vaccine-preventable and treatable illnesses also increases along with the direct mortality from the epidemic-specific disease [15]. This was recently illustrated in the Ebola crisis of 2014-2015 whereby inundated system failures resulted in more deaths from tuberculosis, measles, malaria and HIV/AIDS than Ebola related deaths [15]. It is therefore essential that health managers and providers remain cognisant of this potential scenario to avoid excessive mortality levels and it is brought sharply into focus by the two-thirds of participants in our study who stated that they either agreed or strongly agreed that the pandemic is having a negative effect on patient care. As previously mentioned, one of the early recognisable solutions, albeit speciality and illness dependent, has been the implantation of virtualised care models and MDT's that afford compliance with physical distancing and governmental confinement policies without compromising patient outcomes [3, 6, 16, 17]. The fluid and fast changing nature of the pandemic means rapidly evolving data and practices and it is paramount that all specialities endeavour to learn from each other. For example, some specialities have sanctioned the policy of allowing trainees in their final six months of specialist training to step up to consultant level should there be a staff shortage thereby allowing for a maintenance of senior clinician led patient care [4].

Our study revealed that 73% (66/90), 69% (62/90) and 86% (77/90) of participants either agreed or strongly agreed that the pandemic is having a negative effect on training, research and continued professional development respectively. This is in line with figures quoted by other researchers for example Hoegger et al found that 59% (51/86) of surveyed radiology residents reported fewer educational activities with Poyiadji et al finding that there was an almost two thirds overall decline in resident imaging interpretation volume from pre to intra pandemic time periods [18, 19]. Similarly, Robbins et al found that 70% (75/107) and 83% (89/107) of radiology residents reported a marked or moderate marked negative impact on educational and clinical activities respectively. Despite these alarming figures many innovative proposals exist and have been employed across a number of radiology departments and programs. Firstly, a natural transition has been the adoption of online-based solutions with Hoegger et al finding that 94% (81/86) of participants stated this was the new and alternative method of educational activity [18]. Some programs have suggested a dedicated virtual core curriculum of lectures for residents and daily virtual didactic teaching sessions coupled with virtual rounds to insure continued workflow and patient management [10, 17, 19, 20].

The use of a virtual "townhall" template as a means to debrief, voice concerns and suggest efficiencies along with virtual conferencing platforms and simulation-based training have been among the many propositions advocated and utilised [11, 20-22]. Another novel approach reported by Chong et al is the division of trainees into clinical and remote groups that alternate weekly thereby complying with physical distancing and reduced staff exposure but allowing for continued education and clinical experience [5].

A difficult and stark reality of the Covid-19 crisis is the psychological impact on healthcare workers with early pandemic data by Lai et al revealing that frontline health care workers reported experiencing high rates of depression, anxiety, insomnia and distress [23]. One study by Foley et al found that 40% (106/266) of radiographers reported burnout symptoms due to the pandemic with 30% (80/266) stating they considered changing career or retiring since the crisis began [24]. Moreover, Hoegger et al found that 59% (51/86) of radiology residents reported increased pandemic-related stress levels with Robbins et al finding that three quarters (80/107) of radiology residents perceive a moderate or marked moderate decrease sense of morale [8, 18]. Our study findings are consistent with these results and 88% (79/90) of participants agreed or strongly agreed that the pandemic is having a negative effect on staff morale. It therefore behoves all health care managers, clinical leads, departmental heads and all healthcare staff in general to be acutely aware of this actuality to ensure adequate systems and processes are in place for identification and appropriate management. It is imperative that there is regular promotion of mental health resources, endorsement of online staff networking and engagement with services to prevent adverse psychological outcomes [5, 24, 25].

Whilst there can be no doubt about the huge challenges being encountered during this global pandemic there also lies significant opportunity for trainers and trainees alike. It offers the chance to explore, develop and hone all aspects of virtual learning as well as providing an opening for grant proposals and review articles [17, 19]. Additionally, active onsite involvement by trainees, where feasible, provides a unique opportunity to gain exposure to leadership, teamwork and crisis management [5].

The limitations of this study include the non-randomisation of survey participants and small sample size.

The Covid-19 pandemic has and continues to pose enormous challenges for the delivery of patient care, training, education and staff well-being with various novel and innovative solutions available to healthcare managers and providers.

Acknowledgments:
The authors would like to thank all the participants who took part in this study and wish to acknowledge all healthcare staff who have worked and continue to work during the Covid-19 pandemic.

Declaration of Conflicts of Interest:
The authors do not have any conflict of interest to declare.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P467

Cross-sectional Study of Palliative Care to Hospitalised Patients with COVID-19

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Abstract

Aims

To describe the characteristics, symptoms and outcomes for patients with COVID-19 referred to a hospital-based specialist palliative care service and to describe communication and visiting practices.

Methods

A descriptive cross-sectional retrospective study, which is a part of the ANTICIPATE study project.

Results

50 patients were referred; 49 included in analysis. 38 patients died. 27 patients were male; median age was 81 years. On referral, median Charlson Comorbidity Index was 6; median Australia-modified Karnofsky Performance Status score was 20%. Median number of days from referral to death was 2. Common baseline symptoms (*n*) were dyspnoea (35), agitation (23), and pain (13). Opioids (100%), benzodiazepines (97.1%) and neuroleptics (61.8%) were most commonly used medications to achieve symptom control. 13/19 patients with serial data had a decrease in Palliative Care Problem Severity Score. 26 patients received a family visit before death; 8 had virtual forms of contact. 9 patients had family present at time of death.

Conclusion

The short interval from referral to Specialist Palliative Care and death indicates the need for prompt service response. Data on visiting highlights challenges of providing psychosocial support.

Introduction

Ireland's preparations for management of COVID-19 began in January 2020 with the activation of the National Public Health Emergency Team for COVID-19. The scale of the challenge was recognised to be unprecedented and necessitated a multi-agency response. Reconfiguration was undertaken across the healthcare system, including our own hospital. Recognising the role of palliative care, the hospital-based specialist palliative care (SPC) team were supported to adopt new ways of working. Team members were trained in use of Personal Protective Equipment (PPE) and additional staff were deployed to the service. While visiting restrictions were introduced, it was agreed that exceptions would be permitted for end-of-life care.

Etkind et al. commented in their review that the provision of holistic care in a pandemic can be compromised.[1] The evidence base which largely guided the response of palliative care at the start of the pandemic amounted to a sparse ten articles. Since then, there has been a proliferation of material, however, observational data on hospital-based SPC provision remains limited.[2-5] Similarly, despite emerging evidence of the impact of visitor restrictions on the experience of loss, the predominant focus of literature has been on residential care settings[6,7] and data on visiting for hospitalised patients is lacking.[8]

In our hospital by end-June, 530 patients received in-patient treatment. This paper presents data on a cross-sectional study of patients who received SPC and reflects the experience of management during the pandemic's first wave.

Our objective was to describe the characteristics, symptoms and outcomes for patients with COVID-19 referred to a hospital-based SPC service and to describe communication and visiting practices.

Methods

The study was set in an urban academic hospital in Ireland which has 580 in-patient beds, serves a local catchment population of 295,000 and provides tertiary and quaternary services.
Ethical approval was granted by the Institutional Review Board, Mater Misericordiae University Hospital, Dublin, Ireland (Ref # 1/378/2141).

This is a retrospective cross-sectional study. It is a part of the ANTICIPATE study which aims to determine characteristics and longer-term outcomes of COVID-19 patients.[8] All patients diagnosed with COVID-19 and referred for SPC consultation between 1st March 2020-30th June 2020 were eligible for inclusion. The number of cases with COVID-19 who were referred determined sample size.

Data on patients were extracted from healthcare records and from the Palliative Care Service Patient Register (which includes data on Palliative Care Outcomes Collaborative measures)[9] . Data extraction between 1st June 2020- 30th July 2020. Extracted data were anonymised and inputted into Microsoft Excel®.

Quantitative data were analysed using descriptive statistics. Data are presented as mean (standard deviation; SD) in case of normally distributed variables and as median (interquartile range= IQR) in case of non-normally distributed variables. Qualitative data were analysed using content analysis.

Results

Population characteristics:

In total, 50 patients were diagnosed with COVID-19 and referred to SPC; 49 were included in analysis as one person died before SPC review.

Over half of the patients were male (n=27) and the population was elderly with a median age of 81 years [73-86]. Median Charlson Comorbidity Index[10] score was 6 [5-8]. The majority lived at home before admission (n=38). Patients had a reduced performance status and were heavily dependent. Median Australia-modified Karnofsky Performance Score (AKPS) was 20 [10-20], and median Resource Utilisation Groups- Activities of Daily Living (RUG-ADL) score was 18 [16-18]. Population characteristics are summarised in Table 1.

Table 1: Baseline participant characteristics.

Baseline characteristic (N=49)	*n* or median [IQR]
Gender	
Female	22
Male	27
Age	81 [73-86]
Ethnicity	
White Irish	48
Any other white background	1
Other	0
Charlson Comorbidity Index	6 [5-8]
Hypertension	23
Congestive heart failure	16
Dementia	15
Chronic pulmonary disease	14
Diabetes	11
Advanced/metastatic cancer	10
Renal failure	10
Stroke/neurological disorder	6
Peripheral vascular disorder	5
Liver disease	3
Usual place of residence	
Home	38
Long term residential care (nursing home)	8
Assisted living	3

Previously seen by specialist palliative care services	
No	40
Yes	9
Place of care on referral to Specialist Palliative Care (SPC)	
Ward	49
High Dependency Unit	0
Intensive Therapy Unit	0
PCOC Phase of illness on first review (N=48)	
Dying	20
Deteriorating	15
Unstable	10
Stable	3
Australia-modified KPS (AKPS)	20 [10-20]
Resource Utilisation Groups – Activities of Daily Living (RUG-ADL)	18 [16-18]
Palliative Care Problem Severity Score (PCPSS)	6.5 [5-9]

Specialist palliative care provision

A median of 11 days [4.5-18] elapsed between admission and referral. Referrals were received for two patients prior to their development of COVID-19; all others were referred to SPC following infection. In-person consultation was provided to 44 patients; four were reviewed remotely and phone call advice was provided for one patient who died before being seen. Referrals were responded to promptly; 44 were seen within 24 hours of referral. A total of 223 consultation visits were made- 124 visits were in-person and 99 were remote. The median number of visits was 3 [1-6]. (Table 2).

Table 2: Specialist palliative care provision.

Specialist palliative care provision (N=48)	*n*
Reason for referral to specialist palliative care	
End of life care	36
Symptom control	8
Care planning	5
Symptoms	
Breathlessness	35
Agitation	23
Pain	13
Airway Secretions	11
Drowsiness	7
Delirium	7
Nausea	6
Fatigue	4
Cough	2

Symptom relieving drugs given by subcutaneous infusion in last 24 hours of life (n=34)	
Two medications:	
Morphine +midazolam	3
Morphine + levomepromazine	1
Fentanyl + midazolam	2
Three medications:	
Morphine + midazolam + buscopan	3
Morphine + midazolam + glycopyrronium	1
Morphine + midazolam + levomepromazine	6
Fentanyl + midazolam + levomepromazine	3
Fentanyl + midazolam + buscopan	1
Fentanyl + midazolam + glycopyrronium	1
Fentanyl + midazolam + cyclizine	1
Alfentanil + midazolam + levomepromazine	1
Four medications:	
Morphine + midazolam + buscopan + levomepromazine	2
Morphine + midazolam + levomepromazine + glycopyrronium	4
Fentanyl + midazolam + buscopan + cyclizine	1
Fentanyl + midazolam + buscopan + levomepromazine	3
Oxycodone + midazolam + cyclizine + haloperidol	1
	1
Outcome	
Death	38
Discharged home	7
Discharged back to team	2
Discharged to rehabilitation service	1
Discharged to hospice	1

Palliative Care Outcomes Collaborative (PCOC) Scores were completed on at least one occasion in 48 patients. 19 patients had serial data collection using proxy reporting of the PCOC measures. The PCOC phase of illness on first review was most commonly recorded as 'dying' (n=20); 15 patients were 'deteriorating'; 10 were 'unstable'; and only 3 were 'stable'.

Of the patients referred, 39 (78%) died within the study period. The duration of SPC involvement for those patients who died was short; median number of days was 2 [1-4.5]. There was a longer duration of involvement for patients who survived; median number of days was 15 [6.75-25.5]. The outcomes for the patients who survived were: two improved such that they no longer had SPC needs, resulting in their discharge from SPC review while hospitalised; seven were discharged home; one was transferred to a rehabilitation service, and one was transferred to a hospice.

Patients experienced a range of symptoms, with dyspnoea (n=35), agitation (n=23), pain (n=13) and airway secretions (n=11) most common. Symptom burden was high with a median Palliative Care Problem Severity Score of 6.5 [5-9]. A continuous subcutaneous infusion of medications was required for symptom relief in 34 of the patients who died. The three most commonly used medications used in the subcutaneous infusions were opioids, benzodiazepines and neuroleptics, for 100%, 97.1% and 61.8% of patients, respectively. Doses were low to moderate; the median dose of morphine equivalent infusion in the last day of life was 20mg/24 hours [12-30mg/24 hours].The most commonly used opioid was morphine sulphate (n= 20), although fentanyl/ alfentanil were used in just over one-third of patients because of the presence of renal failure (n= 13). (Table 3)

Table 3: Subcutaneous infusion medications dosage in last 24 hours of life. *

Medication subcutaneous dose mg /24 hours	**Mean**	**Standard Deviation**	**Median**	**Q1**	**Q3**	**IQR**
Morphine equivalent, all doses (n=34)	20.96	9.98	20	11.86	30	18.13
Morphine sulphate (n=20)	17.75	7.37	17.5	10	20	10
Fentanyl (n=12)	520.83	197.33	600	325	675	350
Hyoscine butylbromide (n=10)	100	25.3	120	75	120	45
Glycopyrronium bromide (n=5)	2.16	0.48	2.4	1.8	2.4	0.6
Levomepromazine (n=20)	22.5	15.10	15.63	12.5	25	12.5
Midazolam (n=33)	17.58	12.07	15	10	22.5	12.5
Cyclizine (n=3)	108.33	31.18	100	NA	NA	NA

* Alfentanil (n=1), dose= 3mg SC/24h; oxycodone (n=1) , dose = 10mg SC/24h; haloperidol (n=1), dose = 1mg SC/24h

Do Not Attempt Cardiopulmonary Resuscitation (DNACPR) orders

No advance care plans were in place for any participants prior to contracting COVID-19. A DNACPR order was agreed during hospitalisation for 46 of the 49 patients. The median number of days between admission and instatement was 4 [2-18]. SPC referral most commonly followed agreement of a DNACPR order, and a median of 5 [2-11] days elapsed between instatement of the order and referral. The median number of days between instatement of DNACPR order and death was 11 [4-19 days].

Family visiting and bereavement support

Of the 38 patients who died and were reviewed by SPC, 25 received a family visit prior to death. Visiting was offered to 10 families, who were unable or declined for a variety of reasons. (Table 4).

The median number of days between visit and death was 2 [1-4]. Median number of visits was 2 [1-3]. Visitor identity was documented in 20 out of the 26 patients who received a visit. Only five individuals had visits that included members of their own generation; 15 visits were from members of a younger generation only. The most common reason affecting families where no-one was able to visit was the presence of underlying health conditions (n= 4). At the time of death, nine had family present. After death, 19 had family members visit; while 17 of those families had visited before death, for two of those families this was their first visit.

Virtual video-based contact was facilitated for eight patients who could not manage this independently; recorded voice messages were played for three patients and a phone call was facilitated for two patients who could not manage this independently.

Medical Social Work (MSW) offered bereavement support follow-up to 37 families; one family had declined input prior to death and in accordance with their wishes, they were not contacted. In 36 cases, contact was by phone; in one case it was in the form of a written letter of condolence with bereavement support information provided (Table 4).

Table 4: Family visiting and bereavement support.

Characteristic	n
Reasons for family not visiting prior to death (n=12)	
Own health reasons	4
Fear of COVID-19	2
Experiencing symptoms of COVID-19	1
Status as a COVID-19 contact	1
Patient died before family arrived	1
No immediate family in Ireland	1
No reason documented	2
Bereavement follow up (n=38)	
Phone call not answered, bereavement information posted	4
Phone call answered; required posting of bereavement information only	13
Phone call answered; declined/ did not require posting of bereavement information	6
Phone call answered; practical supports provided and bereavement information posted	5
Phone call answered; additional period of bereavement support (counselling) provided	5
Phone call answered; referral to community bereavement support groups made	2
Written letter of condolence and bereavement support information	1
Family declined Medical Social Worker contact prior to death	1

Discussion

To date, there has been no data published on SPC provision for patients with COVID-19 in Ireland. This study demonstrates effective integration of SPC in our hospital's response. 65 hospitalised patients died as a result of SARS-CoV-2 infection during the first wave, 39 were referred to SPC representing 60% of decedents. SPC input was focused on end-of-life care provision for the majority. However, in one-quarter of cases input was requested for symptom management and care planning illustrating the potential contribution of SPC across the trajectory of serious SARS-CoV-2 illness.

Similar to other observational studies of SPC provision, referrals were for older patients with co-morbidities. All patients received a trial of interventional therapy before referral. The majority of patients were gravely unwell underscoring the need for SPC to be able to respond rapidly to referrals of patients with COVID-19. Although alternatives were used in order to prevent exposure and transmission of virus, in-person consultation was provided for 44 patients. The ability of patients to communicate was impaired and the SPC team experience was that in-person consultation was often needed to accurately assess symptoms and provide psychosocial support.

Symptom burden and management of patients is similar to previous studies.[3,11] A decrease in Palliative Care Problem Severity Score in most patients provides confirmation that symptoms in patients with COVID-19 can be managed with low to moderate doses[12] of opioids and other medications included in the World Health Organization Model List of Essential Medications.[13] Renal failure was present in approximately one-third, and subcutaneous fentanyl or alfentanil were preferentially used for these individuals. This data on medication use and dosage may be used in pandemic planning.

No patient had an advance directive in place, despite the presence of comorbidity. A study of DNACPR orders in our institution has confirmed that the pandemic has prompted more widespread decision-making for patients with and without COVID-19. [14] It has been observed that the nature of COVID-19 is changing how people die, and that frail older people and/ or their families may have to make quick decisions under stressful circumstances.[15] While guidelines recommend that advance care planning discussions are carried out in a sensitive, timely and iterative manner by skilled professionals who are familiar with the individual, the data reveals the scale and pace of decision-making that took place.

Guidance from a European Respiratory Society International Taskforce recommends that loved ones should be supported to visit dying patients with COVID-19.[16] Almost 70% of patients who died, received a visit, demonstrating that it is possible to facilitate visiting. The smaller number of visitors from members of the same generation as the dying individual, likely reflects the awareness of the increased risks associated with becoming infected with SARS-CoV-2 at an older age.

During the first wave, visiting remained constrained in comparison to usual practice. Only 24% of patients had a family member present at time of death, this is comparable to the study by Heath et al. where 19% of patients had a family member present at end of life.[17] This reflects the practice of shorter visits so that families were unable to maintain bedside vigils. A learning curve was evident in our use of technology, and only modest levels of virtual contact were facilitated. In common with others, we found that we needed to gain experience in making adjustments for virtual communication and develop skills in building rapport.[18-20]

Study strengths include the fact that it represents the first documentation of SPC provision to patients with COVID-19 in Ireland. Selection bias was minimised by the inclusion of all patients referred to SPC and complete follow-up. The study included a high number of patients who died from COVID-19 in the hospital, enhancing the generalisability of findings.

It has been noted that well-designed observational studies have an important role in understanding emerging pandemics.[21] This examination of SPC provision has generated clinical insights and hypotheses to support further research; however it has also highlighted the need to accelerate efforts to structure SPC infrastructure so that national clinical data is shared and organisations act as an interconnected learning system. Ultimately, effective palliative care responses are dependent on research that yields quality data and actionable information.

Grant Information:
The ANTICIPATE study is funded by the Health Research Board [COV19-2020-123]. No additional funding was received for this component of the study.

Declaration of Conflicts of Interest:
There are no conflicts of interest to declare.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P468

Orthopaedic Injury Patterns Associated with Electric-Scooter Use

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Abstract

Aim

Urban use of electric scooters (e-scooter) continues to increase steadily in Ireland. This study analysed injuries from a six-month period at an urban trauma receiving hospital. Information derived from this will be shared with the Road Safety Authority to aid in safety and awareness planning.

Methods

Patient records were reviewed retrospectively with data stratified according to demographic and intervention variables. Contributory external and individual variables were also recorded.

Results

15 patients presenting with significant injuries (Abbreviated Injury Scale >2 in at least one body system) requiring surgical treatment were recorded. Injuries included extremity fractures and dislocations, chest, facial, and head injuries. Variable use of personal protective equipment (PPE) was noted. Most accidents occurred during daylight hours and dry weather and the majority of patients had little to no previous e-scooter experience. Many patients had pre-existing health conditions and at least one third were taking regular medications. A larger number of patients (81%) suffered an accident without any external cause and one fifth of patients were initially unconscious.

Conclusion

E-scooter-related accidents can result in severe injuries and steps should be taken to protect users. This may take the form of basic mandatory training and PPE use.

Introduction

According to the Road Safety Authority (RSA), an electric scooter or "e-scooter", is a small platform with two or more wheels that is propelled by an electric motor[1]. By law, these vehicles fall under Section 38 of the Road Traffic Act (1961) and are subject to use with the same specified conditions as mechanically propelled vehicles (MPV)[2]. A Garda statement on MPVs states that, "any users of such vehicles in a public place", as defined in the Road Traffic Act 1961, "must have insurance, road tax, and a driving licence"[3]. E-scooters do not currently meet the minimum required safety standards for vehicle registration, and therefore are not legally permitted on public roads, cycle lanes, pedestrianised streets, or footpaths[2]. For this reason, it is also not possible to tax or insure e-scooters[2]. Therefore, the use of electric scooters outside of one's own property is by law, prohibited[2]. The Department of Transport statement maintains that it is currently illegal to use an electric scooter on a public road[4]. Since the RSA statement on e-scooters issued in 2019[2], Sinn Féin TD Darren O'Rourke revealed Department of Justice figures that show an increase in e-scooter-related collisions from 3 in 2018 to 37 in 2020[5]. There were also 46 road traffic offences by e-scooterists and 91 seizures of e-scooters by Gardaí recorded by October 2020[5]. Amendment to legislation is currently under review at government level[6]. Minister for Transport Eamon Ryan has said he hopes to have the legislation in place in 2021[6]. The subject of much recent public debate[7], there are positive aspects to electric scooters also. For example, they are an economical and environmentally friendly alternative to cars and public transport. Use for work, recreation, running errands and social engagements has increased substantially in recent months[7,8]. A recent economic publication has reported a 700% increase in sales of these vehicles in Dublin during the second six months of 2020 relative to the first six months[8]. In spite of all this, e-scooters, like any vehicular mode of transport, are capable of travelling at speeds sufficient to result in accident and significant injury. No data on injury patterns associated with e-scooter use have been published in Ireland to date. The international literature is also very sparse.

It is the objective of this study to identify common, modifiable factors that may contribute to increased accident incidence or severity. This information will be shared with government agencies with responsibility for road safety to guide safety and awareness planning for all road users and pedestrians.

Methods

All patients involved in an accident with an e-scooter who presented to the emergency department (ED) of the Mater Misericordiae University Hospital (MMUH) were included in this retrospective cohort study. Ethical approval was obtained from the Research Ethics Committee at the Mater Misericordiae University Hospital. The hospital does not routinely collect data pertaining to e-scooter injuries for trauma audit. Incidents involving e-scooters do not have a diagnosis-related group (DRG) and are not routinely classified as road traffic accidents (RTA) or motor vehicle accidents (MVA). Therefore, data for this study was collated using the ED referral log.

A list of medical record numbers for all patients with injuries sustained from e-scooters between July 2020 and January 2021 in MMUH was obtained. A retrospective record review of physical and electronic patient records and radiologic imaging was then carried out. Data pertaining to patient demographics i.e. age and gender, and regarding time of accident, e.g. day of the week, daylight or darkness were recorded. The road type, weather condition, estimated speed, use of personal protective equipment, rider experience level, and reason for journey was also extracted. Patient co-morbidities and medication use, along with substance use was also established. The level of injury sustained, clinical care (i.e. conservative vs. surgical treatment), and outcome (i.e. outpatient vs. in-hospital care) were also noted.

Results

Over the six-month study period, a total of fifteen patients were identified as meeting the inclusion criteria. The mean age of patients was 40.4 years (range 23-65 years). No patient was younger than 18 years of age and 53% were female (n = 8). Fourteen patients (93%) self-presented to the emergency department and one patient was brought in by ambulance (6.6%). All patients were the established rider of the e-scooter.

Ten patients had an Abbreviated Injury Scale of 3 in at least one body system. The range of Injury Severity Scores (ISS) was between 4 and 11 among the fifteen patients (Figure 1).

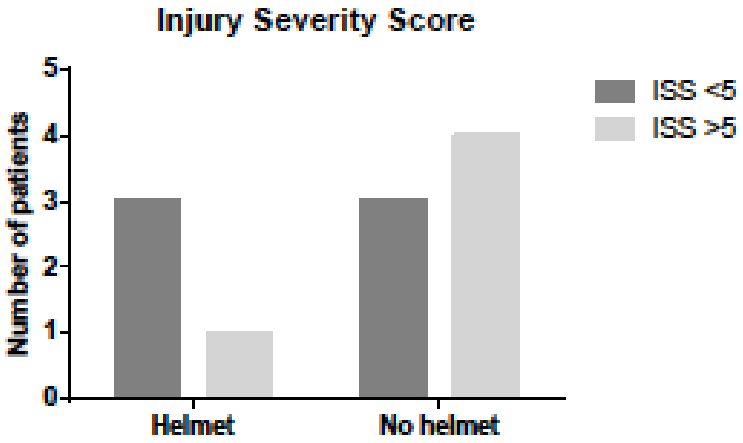

Figure 1: Graphical representation of the number of patients who had experienced an Injury Severity Score (ISS) greater than or less than 5, divided by those wearing a helmet or not.

Of the fifteen patients identified, four did not attend their routine outpatient follow up. This is accounted for in the statistical analysis. Due to restrictions imposed during the pandemic, or winter weather conditions limiting the use of the e-scooter as preferred choice of vehicle, the number of patients involved in e-scooter incidents was lowest during the months of November and December (n = 1 and 0 respectively). September had the highest number of accidents 26% (n = 4, Figure 2).

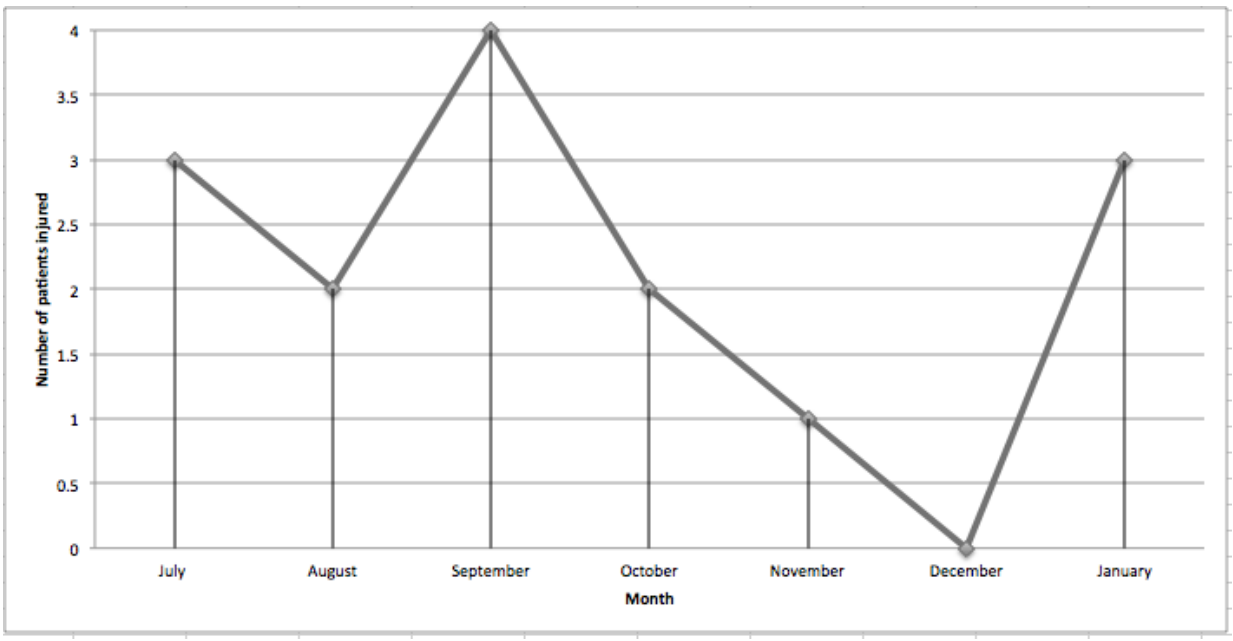

Figure 2: Graphical representation of the number of patients presenting over the course of this investigation.

Overall, twelve patients (80%) of hospital admissions occurred during working hours, on weekdays between Monday 6am and Friday 4pm. Fewer incidents occurred during weekend on-call time i.e. Friday 4pm and Monday 6 am (20%, n = 3). Most injuries were recorded on a Tuesday and Friday (n = 8, 53%). Throughout the week, 60% (n = 9) of the accidents were registered between 6am and 12pm, while 40% (n = 6) were seen between 6pm and 12am respectively.

Sixty-three percent of all accidents happened during the light hours and dry weather. Four incidents occurred during darkness and wet weather (36%). While all eleven patients stated they had lights present on the scooters (100%), no patient admittied to wearing light reflective or Hi Vis clothing. Only two patients stated they were carrying a load in the form of a backpack while on the scooter (18%). (Two patients, both lost to follow-up and thus excluded from the statistical analysis, indicated at presentation that they were carrying bags on the scooter handlebars at the time of the accident.) Two patients reported travelling to work when the accident occurred (18%). Two patients were on their way to pick up groceries, and seven patients were travelling for social engagements (63%). No relationship between make or model of scooter and rate of accident could be established as the vast majority of patients did not report what type of scooter they were driving (n = 7, 63%).

With regard to speed, e-scooters vary. Speeds have been noted to vary between 15-60km/hr on the flat. The slowest accident was reported to occur at approximately 10km/hr (n = 1, 9%, Figure 3). The fastest recorded incident occurred at approximately 60km/hr (n = 1, 9%). The majority of patients were recorded to have been travelling at 20km/hr (n = 5, 45%), and a further 36% of patients travelling at 30km/hr (n = 4).

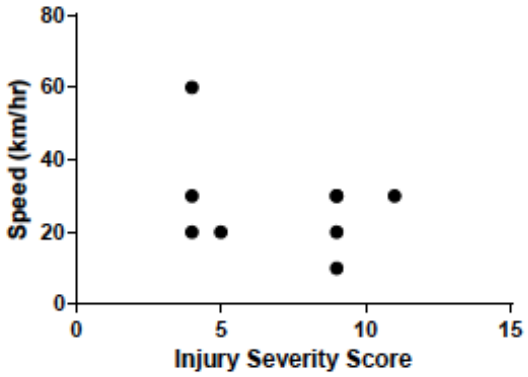

Figure 3: Graphical representation of Speed (km/hr) versus Injury Severity Score, with no significant correlation for comparison.

Two patients reportedly lost control of their scooter for undeclared reasons and collided with a street sign pole (18%), one crashed as a result of a car pulling out (9%), and one scooter was reported to malfunction where the handlebars broke (9%). The remainder of patients reported falling due to road conditions i.e. a defect in the road surface and being unable to activate the e-scooters brake system in time (n = 7, 63%).

Of the eleven scooterists, three of the injured individuals were first time users (27%), i.e. the accident occurred during their very first time using the e-scooter. One user had used the e-scooter once previously, and another two users only had experience riding the scooter 3 and 4 times. Five individuals had driving experience greater than one year.

Of the fifteen patients, nine (60%) stated that they suffered from a pre-existing health condition, and five (33%) were on prescribed medications at the time of the accident. In total, two patients (18%) were documented to have taken alcohol and recreational drugs shortly before the accident.

Shockingly, despite the relatively high speeds the majority of the riders were travelling at, only four patients were using a helmet while using their e-scooter (36%). Three patients (20%) were initially unconscious following the accident. Fortunately, endotracheal intubation or intensive care admission was not necessary in any of the patients.

Overall, every patient suffered from at least one serious injury (100%). A total of nine patients (60%) required surgical management for their injuries. The upper extremities were the main body region affected, with a total of nine injuries (60%). Four of these patients (26%) had to undergo surgical procedures for their upper extremity injury. The second most common injury location was to the lower limbs (n = 6, 40%), of which five (33%) required surgical fixation.

Overall, six patients (40%) were treated as outpatients. In total, nine (60%) of the patients required in-hospital treatment with a mean length of stay of 2.3 days (minimum 0 days, maximum 9 days). Of the fifteen patients, no patient required intensive medical care and no fatalities were registered. Table 1 provides an overview of the contributory factors considered for the accidents and injuries covered in this study.

Risk Factors	Incidence Rate				
Gender	**Male**	**Female**			
	7	8			
Age	**<18**	**18-35**	**36-49**	**50-65**	**>65**
	0	8	4	3	0
Daylight	**Good visibility**	**Dusk/Dawn**	**Dark**	**Unknown**	
	6	1	4	4	
Weather condition	**Wet**	**Dry**	**Unknown**		
	4	7	4		
Estimated Speed	**0-10 km/hr**	**10-20 km/hr**	**30-50 km/hr**	**>50 km/hr**	**Unknown**
	1	5	4	1	4
Helmet Use	**Yes**	**No**	**Unknown**		
	4	8	3		
Rider experience level	**Beginner**	**Less than 1 year**	**1-2 years**	**3+ years**	**Unknown**
	3	5	3	0	4
Use of lights	**Yes**	**No**	**Unknown**		
	11	0	4		
Reason for journey	**Commute to work**	**Running errands**	**Social Engagement**	**Unknown**	
	2	3	6	4	
Other contributing factors	**Carrying weighted objects**		**Under influence of substance**		
	2/15		2/15		

Table 1: Summary of the data obtained related to the potential contributory factors for the e-scooter accidents reviewed in this research.

Discussion

To the best of our knowledge, this is the first study of electric scooter-related injuries in Ireland. We carried out a systematic review of the databases PubMed/MEDLINE, and EMBASE up to February 2021. The combination of search terms were: (orthopaedic) AND (injury) AND (electric scooter OR e scooter). The reference lists of all studies were scanned for additional articles potentially not identified through the electronic search alone. Search was limited to literature from 2020 and 2021. A total number of eight studies were identified, one of which was a review article, and one which focused on facial injuries. Another was a retrospective review looking at data prior to 2019. These three articles were excluded. Four of the five identified articles were carried out in urban and suburban regions of California[10-13]. The other was based in Vienna, Austria[14]. These papers discussed a total of 1044 patients[10-14]. Four of the five papers focused on orthopaedic injuries[10, 12-14]. Siow et al. reported orthopaedic injury rates of 44% associated with e-scooter use[10]. This is near double that noted by Lavoie-Gagne et al. (29%)[13]. Interestingly, both of these papers came from the same city.

Ishmael et al. showed that thirty-two patients (43.8%) sustained upper-extremity injuries, and 42 patients (57.5%) sustained lower-extremity injuries[12]. This is expectedly higher than what Moftakhar et al. reported from Vienna, given the difference in population densities[14]. They reported rates of upper extremities of 36.6%[14]. Interestingly, only three of the five papers discussed helmet use[10, 11, 13]. All rates of helmet use was poor, with usage levels being reported as 2%, 3%, and 3.2% respectively[10, 11, 13]. Finally with respect to age, similar results were noted in comparison with our study (40.4 years). They ranged between an average of 34.4 years[14] to 40.19 years[13].

None of the papers reviewed discussed rider experience level in the context of accident aetiology. In 2019 the RSA commissioned Transport Research Laboratories (TRL) Ltd. to provide a report on electric personal mobility devices[2]. Among their comments were that *initial evidence suggests that experienced riders demonstrate better control than novice users*, and, *are better able to safely brake in response to both planned and unplanned events*. Rather than wait unnecessarily for numbers to increase, we feel it timely and imperative to broadcast the experience and observations from this research, as it can be expected that user and journey volumes will increase substantially in the summer months and as lockdown restrictions are scaled back. Further, legislation for these electric powered personal vehicles will be discussed at government level imminently as it is considered a matter of public health importance. Of the 15 patients treated in our centre, 4 were lost to follow-up and one declined to comment on experience level. Of the 10 patients followed up, 3 reported that the accident occurred during their very first e-scooter journey, and a further 3 patients stated it was on their second, third and fourth journeys respectively. In keeping with the TRL 2019 report, experience or more importantly lack thereof means less control and braking capacity, and in our experience, increases the likelihood of accident and potentially serious injury. By educating aspiring e-scooter users the risks of harmful events occurring can be mitigated.

There are a number of recognised limitations to our study. This is a single urban centre study which set out to only capture those patients requiring in-patient hospitalisation and surgical treatment. The data presented is also influenced by the Covid Pandemic such that overall traffic during the time frame was substantially reduced. Due to the relatively short investigation period, the present study provides observational data of the injury patterns. The study was deliberately published at this time point to coincide with government level discussion of proposed legislation. This study shall be continued prospectively.

Electric scooter-related accidents can result in severe injuries requiring hospitalisation, surgical treatment, and prolonged rehabilitation. It has been our observation that those presenting to hospital with injuries requiring surgical treatment have limited e-scooters experience. This, we believe, should inform a strategy to guide users during the initial periods of use of e-scooters.

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

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P469

Responding to COVID-19 Related Mental Health Impacts Among Elite Athletes

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Abstract

The COVID-19 pandemic has impacted considerably on elite athletes' performance. In this paper, we aim to examine how the psychosocial effects of COVID-19 may impact on athletes. First, mental health problems are as common among elite athletes as among the general population. Second, the mental health effects of COVID-19 are common in adolescents and young adults. Third, there are recognised gender differences in mental health related help-seeking behaviour. There is emerging evidence that these issues may be exacerbated by the pandemic. While there is little evidence on what interventions may help to address this problem, it is possible that optimising the identification and treatment of mental health problems (in an appropriate and acceptable manner) and promoting team cohesion and interaction may be effective. Addressing this issue is important for all team doctors and healthcare professionals associated with sports teams (both elite and non-elite).

It is generally recognised that the performance of elite team sports has been adversely impacted by the COVID-19 pandemic. This has been especially the case for elite sports that are amateur in nature (especially Gaelic Games). The fundamentally changed experience of playing elite sports since the COVID-19 pandemic, with greatly diminished crowds, less social contact, altered team preparations, etc drive this phenomenon. But only to some extent - as we believe the psychosocial effects of COVID-19 affecting individual players are an important determinant, or at least exacerbator, of how elite teams perform and thus an important area for team doctors to address.

There are several reasons for this. First, there is increasing recognition that elite athletes suffer from mental health symptoms and disorders at rates equivalent to or exceeding those in the general population [1,2] and pandemic era research also indicates that mental health issues among athlete populations are a concern [3].

Second, research shows that the mental health consequences of COVID-19 are especially marked in adolescents and young adults, a cohort which constitutes a large proportion of elite athlete populations [4]. Third**,** it is now accepted that 'men are less likely than women to seek help for mental health issues, with socially constructed masculinity norms in men's help-seeking behaviour for mental health issues a major reason for this' [5], and negative help-seeking attitudes are believed to especially prominent among male athlete populations [6].

While much of the literature on caring for athletes during the COVID-19 pandemic has focused on cardiac complications, screening for asymptomatic disease and return to sport[7], having a better understanding of how COVID-19 has impacted on elite players' mental health and wellbeing is essential for many reasons. Most importantly, this knowledge will help promote athletes' mental health and wellbeing, but from a sporting perspective, it will also help towards ensuring that athletes and teams perform to their full capability.

To our knowledge there is no large-scale numeric data outlining COVID-19 related changes in rates of mental health issues among elite athletes. However, a recently published narrative review outlined how the pandemic may precipitate or worsen mental health symptoms due to social isolation, cancelled schedules, loss of income, loss of access to training venues and team staff, teammates and coaches, family infection risks, loss of daily routines and selfcare, anxiety about contracting COVID-19 during sporting events, and persistent community distress and family conflicts [7]. These impacts will inevitably affect performance at a personal and collective level, and strategies to address this should therefore be considered by medical teams who are caring for elite athletes. This is especially the case for doctors caring for vulnerable groups who may be more susceptible to such issues including female and impoverished populations[8].

At an individual level, it is important to identify mental health problems, and to initiate any treatment that may be required. However, doing this in a manner that is acceptable to the athlete(s) is important, especially if dealing with groups of young men who may be reluctant to discuss mental health symptoms. In this specific setting, it should be remembered that the sports team may very well be a 'trusted community' where discussion of mental health symptoms can be accommodated, if even indirectly[5] (p.16).

At a collective level, strategies that promote team cohesion, especially when training / team meeting schedules are curtailed, are important. These are well described by Moran and Toner, who highlighted the value of social activities and games in this regard and cite specific examples of successful teams who have adopted these techniques[9] (p.261-294).

But viewed more broadly, mental health identification and treatment in young athletes needs a different approach, and perhaps COVID-19 will encourage society and sporting organisations to address this issue. There is already some indication that this is happening in Ireland as evidenced by recent GAA, FAI, IRFU, and Sport Ireland initiatives among others. Although sports participation provides benefits that can be protective for mental health, stressors unique to sport compound

mental health problems among adolescents and young adults. The importance of multidisciplinary teams and coordination of care can provide a holistic approach that ensures young athletes optimize their personal and athletic goals[10]. That said, systematic reviews of interventions to increase awareness of mental health and wellbeing in athletes' coaches and officials have found the quality of evidence in this area to be lacking[11].

Adolescents and young adults frequently experience mental health problems but tend not to seek help. Stigma and embarrassment, poor mental health literacy and a preference for self-reliance are often identified as important barriers to help seeking[12]. While facilitators remain comparatively under researched, there is evidence that past positive experiences and social support can aid a person's help seeking behaviour and intervention strategies for improving help seeking in young elite athletes should focus on improving relations with potential providers[13] .

However therein lies the difficulty. Current models need to change to facilitate young adults to access mental health services. There are examples in Ireland (e.g., Jigsaw Youth Mental Health) and worldwide (e.g., Headspace – National Youth Mental Health Foundation) of how changing services to adapt to the needs of young people needs can enhance accessibility and acceptability. The work of McGorry et al [14] offers considerable promise, especially if it could be expanded to work with and support young athletes in collaboration with community-based sporting organisations.

Servicing the unique characteristics and needs of athletes allows us to address health threats experienced by young adults more broadly. In this group, mental health is heavily influenced by a myriad of factors compared to the general population; a higher prevalence and burden of disorder coupled with lower levels of access to mental health supports. Using existing networks, such as community-based sports clubs, could advance the awareness and management of mental health problems given their regular contact with adolescents and young adults.

In summary, COVID-19 has impacted on how elite athletes perform. The reasons for this are complex and inter-related, but the effect of the pandemic on an athlete's mental health and wellbeing is likely to be an important factor. Especially after the pandemic, we recommend that elite teams (and their medical teams) aim to, or continue to, support the mental health and wellbeing of their players, and consider strategies such as regular checks, optimizing access to (psychological / pharmacological) treatment if necessary, and promoting team cohesion through regular (socially distanced / virtual) social interaction. For those GPs who act as team doctors for such elite teams in the UK, Ireland and indeed internationally, there exists a unique opportunity to improve performance by being mindful of the considerable psychological impact of COVID-19 on individual players. As the 2021-22 sports seasons unfold, it is possible that the lessons learned may have wider benefits for population health; involvement in team-based sports activity can be an important protective factor against adverse COVID-related mental health outcomes. Lastly, further research is needed examining policies and procedures for mental health screening/ management/ reporting in elite sports.

Declaration of Conflicts of Interest:
The authors declare that they have no competing interests.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P470

Significant Increased Headache Presentations to the Acute Medical Unit Coinciding with Universal Masking

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Abstract

Aims

We explored the impact of universal masking recommendations with temporal trends in headache presentations to our acute medical unit. We explored numbers of headache presentations and any concomitant changes in carbon dioxide (CO2) levels of patients.

Methods

We compared all patients presenting with acute headaches to our acute medical unit from June 2020 to August 2020 and from June 2019 to August 2019.

Results

We found that there was a 2.9 fold rise in the absolute number of patients presenting with headaches to the acute medical unit from 2019 to 2020 (113 vs 329). There was no statistically significant difference in mean CO2 levels (23.318 vs 23.07, p = 0.27).

Conclusion

We found a large increase in headache presentations to our acute medical unit. This may represent a new phenomenon of "mask-induced headaches" in the general population. There was no rise in average CO2 levels from 2020 to 2019, which we believe is an important message to combat the spread of fake news surrounding mask wearing.

Introduction

COVID-19 presented significant challenges in provision of acute medical care. Our institution adapted by reconfiguring the acute medical unit (AMU), with direct triage of all medically stable patients to AMU from ED. Coinciding with this reorganization, self-imposed mask wearing had seen exponential increases, with month on month increases seen internationally in the proportions wearing face masks [1].

There is good evidence that universal masking can help reduce the transmission of COVID-19 infections [2], but despite this there have been concerns in the media that there have been increases in the proportion of people suffering from headaches, with hypercapnia the putative mechanism behind this reported increase [3]. We sought to examine temporal trends in headache presentations, and to examine if there was any change in CO2 levels among patients with headaches.

Methods

A prospectively maintained logbook was reviewed. All patients presenting to the AMU with headache between June 2020 and August 2020 were included and compared. This time period was after the Irish National Public Health Emergency Team (NPHET) recommendations for the use of face coverings in situations where physical distancing is challenging [4]. We compared a similar time period of June 2019 and August 2019, to account for seasonality in presentations to the AMU. Proportions were compared using the Chi-square test, and means were compared using the t-test.

Results

We found that in the two corresponding time periods there was a 2.9 fold rise in the absolute number of patients presenting with headaches to the acute medical unit (329 vs 113) (Table 1). There was no statistically significant difference in mean carbon dioxide levels (23.318 vs 23.07, p = 0.27). From 2020 to 2019 there was no difference in patient mean age, proportion who were female, or use of neuroimaging (Table 1). There was a statistically significant difference in the proportion of neuroimaging that had clinically significant abnormal findings (8.9% vs 1.1%, p = 0.01). There was a statistically significant reduction in the proportion of lumbar punctures performed (8.8% vs 18.1%, p= p.006).

Table 1: Results

	June-Aug 2019 N = 113	**June-Aug 2020 N = 329**	**P value**
Mean CO2	23.07	23.318	0.27
Mean Age	44	47	0.12
% Female	62.6%	62.1%	0.87
Neuroimaging performed	79.6%	79.3%	0.93
Abnormal findings on Neuroimaging	1.1%	8.9%	0.01
Lumbar Puncture performed	18.1%	8.8%	0.006

Discussion

We have demonstrated a significant increase in the number of patients presenting to our acute medical unit with headaches over a corresponding time period. We feel that this may represent a new phenomenon of "mask-induced headaches", given that a large proportion of patients presenting during the 2020 time period would have been wearing face masks. Healthcare workers have been demonstrated to develop de-novo PPE-associated headache or exacerbation of their pre-existing headache disorder [5], and we believe this is a phenomenon among the general population as well. Healthcare workers should consider this in their differential diagnosis when assessing patients with new onset headaches.

The pathogenesis of mask-induced headache could be explained by several different factors. Mechanical factors may be considered, with pressure from a tight-fitting mask or mask ear loops contributing, or potential changes in upper airway conditions and nasal physiology [6]. While our review did not collect routine data on hypoxemia, this is another potential factor reported from the wearing of the N95 mask for 4 hours, with significantly reduced PaO2, chest discomfort and increased respiratory rate [7]. Hypercapnia has been subject to much attention on social media as a potential cause, though our results do not support this, as we identified no difference in the average CO2 levels from 2020 to 2019.

Some limitations should be noted. Firstly, owing to the time of year, dehydration could also be considered as a cause of headache, though to account for this we chose similar time periods in each comparative group. Consideration could also be given to an increased level of stress, a well-known trigger of headaches, owing to the pandemic.

In conclusion given our high patient numbers this supports the hypothesis that there is no association between mask wearing and hypercapnia. We believe this is an important message to help combat damaging misinformation on social media platforms [8]. Promoting community mask wearing is important, as there is compelling evidence that we have little to lose, but potentially a lot to gain [9]. There may be fluctuations in public health mask wearing recommendations in the future, and if routine mask wearing is ever reintroduced after a period without widespread use, clinicians should be aware of the association between the introduction of mask wearing and increased headache presentations.

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

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P471

An Incidental Finding of a Lingual Thyroid Gland

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Abstract

Introduction

Thyroid ectopia is a rare entity resulting from abnormalities in gland embryogenesis during its passage from the tongue base to its normal orthotopic site.

Diagnosis

A 63 year old female presented with otalgia and facial pain to the outpatient department. The patient was diagnosed with temporomandibular joint (TMJ) dysfunction and during examination an incidental lingual thyroid gland was discovered.

Treatment

The patient was clinically and biochemically euthyroid on 75 micrograms of levothyroxine. No treatment was required as the patient was asymptomatic.

Discussion

Lingual thyroid is the most frequent location of ectopic thyroid tissue. Patients are frequently hypothyroid.

Introduction

Thyroid ectopia is defined as functioning thyroid tissue occurring anywhere other than its orthotopic site. Lingual thyroid is the most common ectopic location, but it can occur anywhere along the normal path of thyroid descent. Excessive migration may lead to a mediastinal or distant subdiaphragmatic position in very rare cases. A lingual thyroid may represent the only functional thyroid tissue and inadvertent excision may lead to profound hypothyroidism.

Case Report

A 63 year old female was referred to the ENT outpatients with right facial pain and otalgia. Her past medical history was significant for hypothyroid diagnosed at age 32, for which she was on Levothyroxine, and a hiatus hernia. She was an ex-smoker with a twenty-pack year history and consumed eight units of alcohol per week.

She had no dysphagia, no dysphonia and no weight loss. Examination of the neck was within normal limits. Flexible nasendoscopy revealed a smooth, well defined submucosal mass at the tongue base. She underwent a CT Neck to examine for the presence of a thyroid in the normal position. This showed an avidly enhancing soft tissue mass in the base of tongue in keeping with an ectopic thyroid. There was no thyroid gland present in its usual anatomic location.

Figure 1: Enhancing mass seen at tongue base with absent thyroid in the usual pretracheal position.

Figure 2: Clinical photograph taken during flexible nasoendoscopy which showed a submucosal mass at the tongue base.

Discussion

Ectopic thyroid is a rare entity derived from abnormalities in migration of the thyroid gland along the normal path of descent. The entire gland fails to descend to the usual position in the neck and if descent is completely arrested a lingual thyroid results. Its prevalence is about 1 per 100,000 – 300,000 people and it is more common in females [1].

The thyroid gland forms at a midline depression at the border of the anterior and posterior tongue known as the foramen caecum. A ventral diverticulum of the foramen caecum forms at four weeks gestation. This descends in the midline of the neck as the thyroglossal tract to reach the pretracheal position of the normal thyroid gland at about week seven [2].

Lingual thyroid is the most frequent location of ectopic thyroid tissue, accounting for about 90% of cases [3]. Hormone production with lingual thyroid is usually insufficient and thus patients are frequently hypothyroid [1]. If hypothyroidism develops the ectopic thyroid may enlarge due to TSH stimulation. Patients may present with symptoms related to the growth of the lingual thyroid such as dysphagia, dysphonia, sense of a foreign body and oral haemorrhage [4, 5]. More frequently lingual thyroid is an incidental finding during investigation for non-thyroid related symptoms.

The differential diagnosis depends on the location. It is necessary to distinguish between ectopic thyroid and metastatic deposits as well as benign or malignant processes that may arise in the area of presentation. Carcinoma arising in a lingual thyroid is very rare with less than 30 cases reported in the literature [6]. There is no consensus in the literature regarding the treatment for lingual thyroid due to its rarity. Thyroid function testing is necessary as part of the work up and replacement therapy may successfully treat patients with mild symptoms [5].

Declaration of Conflicts of Interest:
None to declare.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P472

Acquired Angioedema in a Child with Systemic Lupus Erythematosus

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Abstract

Presentation

A fifteen-year-old girl newly diagnosed with SLE presented acutely with facial swelling, dysphagia and dysphonia.

Diagnosis

Clinical and radiological features coupled with a low C1q level led to a diagnosis of acquired angioedema.

Treatment

The patient responded to treatment with C1-inhibitor concentrate.

Conclusion

Acquired angioedema can be a presenting feature or a complication of SLE.

Introduction

Systemic lupus erythematosus (SLE) is a chronic multisystem autoimmune disease. It is caused by loss of self-antigen tolerance, leading to development of autoantibodies and immune complexes that can be deposited in tissues leading to organ damage. Angioedema (AE) is swelling of the submucosal and/or subcutaneous tissues by fluid extravasation into interstitial tissue.

It can be mast cell (allergic) or bradykinin-mediated. Bradykinin-mediated AE can be hereditary (HAE) due to mutations in the *SERPING1* gene, leading to reduction in C1-esterase inhibitor (C1-INH) enzyme levels or function, or acquired (AAE). We present a case of AAE in a paediatric patient newly diagnosed with SLE.

Case Report

Our patient (P1) presented with a history of gradual onset joint pain, headache, and fatigue. She had a malar rash, active synovitis, hypertension, haematuria and proteinuria. Results of other investigations are listed in Table 1. Juvenile SLE (JSLE) was suspected, and the patient commenced on a combination of oral prednisolone and hydroxychloroquine pending renal biopsy to ascertain renal involvement.

P1 subsequently developed acute, non-pruritic, non-pitting, painful swelling of the left side of her face associated with difficulty swallowing and speaking, and oral ulceration. She had no allergic history, no urticaria, and no known exposure to suspected allergens. A craniofacial MRI (Figure 1) demonstrated extensive angioedema in the cheek and neck region, a focal area of retropharyngeal oedema and supraglottic oedema in the region of the arytenoids. Laboratory investigations (Table 1) demonstrated elevated inflammatory markers, undetectable C1q levels, elevated anti-C1q antibodies, normal C1-INH antigen and function and no evidence of anti-C1-INH antibody levels.

Differentials considered at the time included Vincent's angina, allergic and idiopathic angioedema. However, the combination of clinical and laboratory features established the diagnosis of AAE[1]. P1 was treated acutely with C1 inhibitor concentrate (1,000 U) which resolved the swelling after three doses. P1 was prescribed and trained in self-administration of icatibant as emergency treatment for any subsequent episodes of AAE. A renal biopsy confirmed stage IV membrano-proliferative glomerulonephritis. Her JSLE is currently well controlled after addition of mycophenolate mofitil, and she has had no further episodes of AAE.

Figure 1: Axial T2 fat suppressed image demonstrating supraglottic oedema noted at the level of the arytenoid cartilages (Block white arrow). No oedema of the true vocal cords (not shown) was noted. There is oedema noted in the subcutaneous soft tissues below the mandible extending onto the anterior neck (thin white arrow).

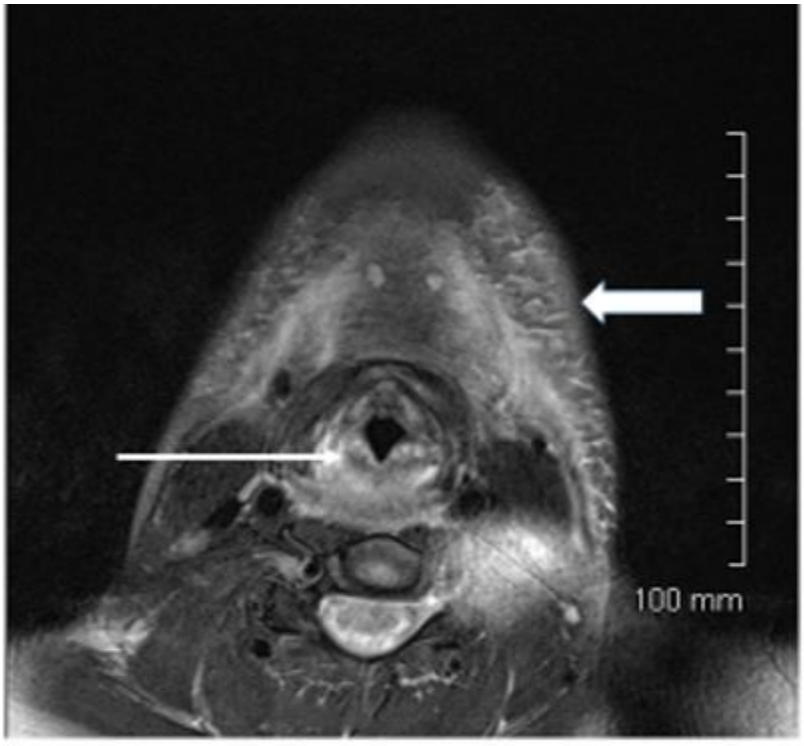

Table 1: Relevant Immunology laboratory results.

Parameter	**Value**	**Normal ranges**
White cell count (x 10^9/L)	11.39	(4.0-11.0)
Neutrophil count (x 10^9/L)	8.66	(1.8-8.0)
C-Reactive Protein (mg/L)	40	(< 10)
Erythrocyte Sedimentation rate (mm/Hr)	42	(1 - 9)
C3 protein (g/L)	0.56	(0.7-1.7)
C4 protein (g/L)	<0.08	(0.1-0.7)
C1q protein (mg/l)	<13	(50 – 250)
C1-INH antigen (g/L)	0.45	(0.15 - 0.43)
C1-INH function	normal	-
Anti-C1q antibodies	> 400	-
Anti-C1-INH antibodies	negative	-
Anti-nuclear antibody (ANA)	>1:160	-
Anti- DNA antibodies (Critidia)	1:160	-

Discussion

AAE was first described in 1972 in association with lymphosarcoma [2] and has subsequently been seen in association with other haematological malignancies [3; 4]. It can also be both a presenting feature and complication of SLE [5; 6]. SLE has been shown to represent an independent risk factor for hospitalization for angioedema [7]. The exact patho-physiology of AAE is unclear. It may be due to inactivation of C1-inhibitor by auto-antibodies or binding of C1-INH by anti-idiotype antibodies leading to formation of immune complexes that activate the C1 pathway, thereby consuming C1-INH.

The incidence of AAE is unknown, but in one centre was estimated to be approximately one tenth that of HAE[8]. AAE tends to occur in older females, particularly after the fourth decade[3; 4; 8], but rarely cases have been described in younger patients with JSLE similar to P1 [9]. Unlike HAE, there is a higher incidence of facial and laryngeal acute angioedema attacks [3; 4; 8]. Attacks can be life-threatening (due to airway obstruction from laryngeal oedema) and recalcitrant to standard treatment [3; 10]. Treatment of acute episodes includes C1-INH concentrate (given IV at a dose of 20mg/Kg) or icatibant, a selective competitive antagonist of the bradykinin type 2 receptor. Treatments used for long term prophylaxis include regular IV/subcut C1-INH concentrate, antifibrinolytic agents (e.g. tranexamic acid), attenuated androgens (e.g. danazol). More recently, lanadelumab, a monoclonal antibody to kallikrein that can be administered subcutaneously, has been used as long-term prophylaxis.

This case report highlights the need to consider both HAE and AAE in patients with SLE who present with acute angioedema, and the need to consider autoimmune conditions such as SLE and/or haematological malignancies in patients who present with bradykinin-mediated angioedema and no evidence of HAE.

Declaration of Conflicts of Interest:
None to declare.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P473

Use of Carbon Fibre Implants in Metastatic Spinal Surgery

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Abstract

Introduction

Surgical management of metastatic spinal disease has become an increased area of focus for oncologists and spinal surgeons. We describe our initial experiences using carbon fibre implants in the treatment of metastatic spinal disease.

Case 1

A 67-year-old male with known metastatic colorectal cancer presented to his GP with a 3-month history of lower back pain. He was subsequently diagnosed with an L1 lesion and underwent a T11-L3 posterior spinal fusion using carbon fibre fixation.

Case 2

A 68-year-old previously well male presented to his local ED with a 10-week history of mid thoracic back pain. Imaging revealed a T7 lesion for which he underwent a T5-T10 posterior spinal fusion using carbon fibre fixation. Intra-operative histology revealed metastatic prostate cancer.

Case 3

A 76-year-old female who presented to her local ED with a six-week history of progressive lower limb weakness. Imaging revealed a T10 metastatic lesion for which she underwent a T8-T12 posterior spinal fusion using carbon fibre fixation.

Outcome

3 patients underwent spinal stabilization surgery using carbon fibre fixation in our institute. None of the patients had any post-operative complications and all underwent post-operative radiotherapy.

Introduction

There have been significant advancements in medical oncology over the previous 20 years. Patients are living longer with metastatic disease. As a result, the surgical treatment of metastases has become an increased area of focus. Surgical intervention involves relieving pressure off of the cord and stabilizing the spine using metal implants. Patients are often good surgical candidates for operative intervention. Surgery may involve oncologic resection or debulking tumor load, decompressing the spinal canal and neural tissue and stabilizing the spine with internal fixation either anteriorly, posteriorly or both.

Patients with metastatic disease can be referred urgently or emergently to a spinal center. Those referred in emergently, often have acute neurological deficits. Patients can have their spinal instability neoplastic score (SINS) calculated which helps guide management. The higher the score, the more likely surgical intervention is required. Those referred for consideration of surgical stabilization should have a reasonable life expectancy and be physically fit enough for intervention.

Implanted material was traditionally made of either titanium, stainless steel or cobalt chrome. There are several disadvantages to these materials when treating metastatic spinal disease. Artefact on post-operative imaging can obscure tumor recurrence with surveillance scans, but more importantly, metal implants can adversely affect the dose, accuracy and efficacy of prescribed adjuvant radiotherapy. These challenges lead to the use of carbon fibre fixation sets which aim to overcome these disadvantages.

Case Presentations

The cases discussed relate to three patients who underwent stabilization surgery using carbon fibre implants between March and December 2019. Patients were discussed at a weekly MDT involving at least two spinal surgeons, anesthetics, and radiation oncologists. The patients were selected based on their confirmed or presumed underlying primary malignancy, tumor suitability for fixation and prognosis.

Case 1

Patient 1 was a 67-year-old male who presented to his GP with a 3 month history of lower backpain on a background of metastatic colorectal carcinoma.

The patient subsequently underwent MRI imaging which revealed an L1 lytic lesion with compression of the conus medullaris.

After inter-hospital MDT discussion, the patient was transferred to our institute for decompression and T11-L3 posterior stabilization using carbon fibre implant sets. Pre and post operatively the patient had no neurologic deficit.

Below (Image 1) is an MRI performed day one post-operatively. It must be noted that there is considerable artefact on the post-operative imaging. This causes loss of visualization of the spinal cord. This occurred because carbon fibre implant sets still contain a small metallic component. This can cause potential metal susceptibility artifact which manifests as darkness on the image as seen below. This MRI was undertaken on a 3T scanner which is a higher power than a 1.5T scanner. Metallic artefact is more pronounced on higher magnet strengths. The difference in post-operative imaging suggests we should be using the 1.5T MRI for follow up imaging, as there is less artefact present. The patient underwent post-operative radiotherapy and had an uncomplicated post-operative course. The patient passed away in February 2020 due to their underlying primary cancer.

Image 1: Post-operative T2 weighted sagittal MRI (This scan was undertaken on a 3T MRI scanner. There is a loss of signal. The spinal cord cannot be visualized.)

Case 2

Patient 2 was a 68-year-old gentleman who initially presented to his local hospital with 10-week history of mid-thoracic back pain and 10kg unintentional weight loss.

The patient subsequently underwent CT scanning which demonstrated a destructive lytic lesion involving the T7 spinous process. Subsequent MRI (Image 2) showed a T7 lytic lesion with involvement of posterior elements and acute expansion with severe narrowing of the thoracic spinal canal. Given the patients demographics and appearance on imaging, a prostate primary was the most likely underlying malignancy.

After MDT the patient underwent a T7 decompression and T5-T10 posterior spinal fusion. T7 and T9 were skipped as these contained metastatic deposits.

Intra-operative histology samples confirmed metastatic prostate cancer. The ASIA score was T6 AIS D pre and post operatively. Post operatively the patient had a sensory deficit only. Below is his post-operative imaging. This MRI was undertaken on the 1.5T MRI scanner, as demonstrated there is significantly less artefact and we can visualize the spinal cord and adjacent structures. Below is an intra-operative image demonstrating a T5-T10 spinal fusion. The patient was lost to follow up.

Image 2: Post-operative T-2 weighted sagittal MRI (This is an image from a 1.5T scanner. The spinal cord can easily be visualized. This can be compared to the earlier MRI in which imaging of the cord is obscured.)

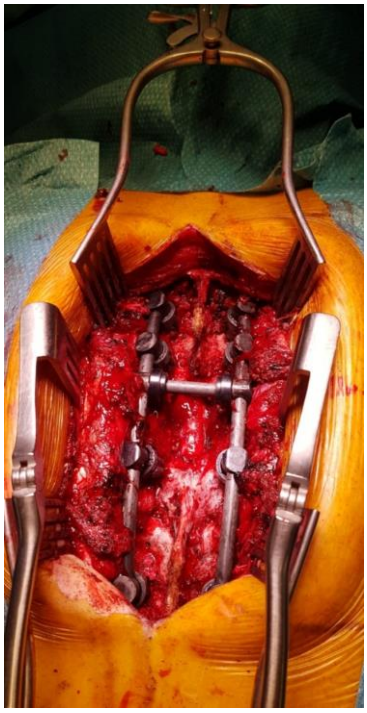

Image 3: Carbon fibre implants (An intra-operative picture)

Case 3

Patient 3 was a 76-year-old female. She initially presented to her local ED with progressive lower limb weakness and recurrent falls over the previous six weeks. On examination she was hyper-reflexic, had left leg weakness and upgoing plantars bilaterally.

An MRI whole spine reveled a T10 likely metastatic deposit with retropulsion with spinal cord compression (Image 4).

Based on multiple factors including imaging appearance, clinical examination and laboratory results lymphoma was suspected as the underlying malignancy.

After MDT discussions, the patient was transferred to our institute for surgical stabilization. The patient subsequently underwent a T8-T12 posterior stabilization. Intra-operative histology samples confirmed non-Hodgkin's lymphoma. The patients pre and post-operative ASIA score was T7 AIS D. This patient underwent a post-operative CT scan demonstrated below.

Image 3: Post-operative CT scan demonstrating T8-12 fusion. (There is limited artefact present. The patient passed away in December 2020, 6 months following her surgery.)

Results

Due to medical oncological advancements the surgical treatment of metastatic spinal disease is becoming an increasing area of focus for spinal surgeons. Patients are living longer with metastatic disease. As a result, the optimal treatment for this cohort is being explored further.

Increasing numbers of patients are physically well enough to undergo surgical intervention. Surgical fixation involves stabilization with metal implants. These implants have several disadvantages related to administration and delivery of adjuvant radiotherapy. Carbon fibre aims to overcome these disadvantages.

Due to the limited availability of health resources, consideration should be given to which patients will benefit the most from these implants. Another point that warrants consideration is where will the funding for the more expensive implants come from. If this is considered a specific assistant to oncologic management, these implants should possibly be funded through oncology funding streams, rather than surgical funding streams.

We recommend further larger follow up studies to assess the efficacy of carbon fibre implants in the surgical treatment of metastatic spinal disease.

Discussion

The purpose of spinal stabilization surgery and decompression in metastatic disease is to improve the quality of life for patient's living with a diagnosis of malignancy. Untreated, intractable pain and profound neurologic deficit may significantly worsen the quality of life for a patient who may have an otherwise good short to mid-term prognosis.

Metastatic tumors account for 97% of spinal tumors[1]. The most common underlying malignancies to metastasize to the spine are breast, prostate, renal, lung and thyroid[2]. As many as 70% of patients with cancer have spinal metastases and up to 10% will develop some degree of spinal cord compression[3]. This demonstrates the huge workload that spinal tumors represent.

The main treatment option for most spinal metastases is radiotherapy and particularly, external beam radiotherapy (EBRT) and brachytherapy[4]. Surgical intervention is recommended for spinal instability, spinal cord compression and those with radioresistant tumors[5].

Radiotherapy was the main stay of treatment of metastatic spinal disease up until 2005, when Patchell et al.[6] demonstrated that surgery combined with radiotherapy was greatly superior to radiotherapy in this cohort. Those who underwent surgical stabilization followed by radiotherapy were much more likely to be ambulatory compared to those who underwent radiotherapy alone. This revolutionized the treatment of those with metastatic spinal disease.

A wide range of surgical procedures can be undertaken, however most combine a decompression which relieves pressure on the spinal cord and stabilization to prevent collapse of the spine. Traditionally, stabilization was undertaken using titanium instrumentation sets.

However, there are several disadvantages to using titanium in this cohort. This led to the early use of carbon fibre in this group to overcome these disadvantages. The main advantages the use of carbon fibre has over traditional metal is their radiolucency and enhanced adjuvant radiotherapy.

This lack of artefact permits more accurate prescribing and administration of post-operative radiotherapy and allows visualization of potential post-operative complications such as hematomas or deep infections. Carbon fibre implant sets are radiolucent on traditional radiographs and barely visible on CT and MRI scans[7]. Furthermore, the absence of artefact also has potential benefits for adjuvant radiotherapy. There is minimal interference with post-operative radiotherapy, producing better outcomes. Adjuvant radiotherapy is valuable because of the difficulty in obtaining clear margins in many cases.

Potential benefits of carbon fibre implants are more effective delivery of post-operative radiotherapy.
The presence of metal artefacts on CT distorts the calculation of required radiotherapy potentially leading to under or over treating residual metastatic disease. There are also difficulties in delivering the prescribed dosage of radiotherapy, with a 5-10% decrease in dosage penetrating posterior to the metal rods as a result of attenuation[8]. This can lead to underdosing of residual tumors, thus, been ineffective. More concerning is the potential to over-dose tumors, which can lead to radiation myelopathy a feared complication of post-operative radiotherapy.

There can be a scattering effect when delivering radiotherapy to the residual lesion caused by the presence of high atomic number metals such as titanium, which can also lead to radiation myelopathy. Carbon fibre has a much lower carbon number equivocal to adjacent biological structures and as a result, there is less scattering effect.

One major disadvantage to using carbon fibre implant sets is the inability to contour the rods intra-operatively. This potentially may make the implants more unsuitable to longer fusions or those that cross transitional zones. Another disadvantage of carbon fibre is that it may not enjoy the same mechanical properties of metallic implants, and therefore be prone to earlier failure. This risk must be weighed against the potential advantages of is use, as described above. Carbon fibre implants are also significantly more expensive than titanium. The economic considerations for their use need to be justified. In that sense, the opinion of radiation oncologist is typically sought before using carbon fibre, to ensure there is a practical value.

The cost of a set consisting of eight screws and two rods, which in an isolated metastatic deposit represents fixation two levels above and below the affected segment. The cost of a carbon fibre set is approximately 9000 euro compared to approximately 3500 euro for a titanium set.

Furthermore, in an era with a strong focus on health economics, there is strong evidence that surgical stabilization followed by radiotherapy is cost effective in terms of cost per extra day of ambulation and cost per life year gained compared to radiotherapy alone.[9]

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

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Established 1867

Issue: Ir Med J; Vol 114; No. 9; P474

Introduction of a Targeted Chlamydia Screening Program in a Tertiary Level Maternity

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Dear Editor,

Chlamydia trachomatis (CT) is an STI most commonly found in younger people. In Ireland, there is an incidence of 164.4/100,000 amongst women, with a median age at diagnosis of 23 years. Infection with *CT* during pregnancy is associated with fetal morbidity, including neonatal pneumonia, LBW and pre-term labour[2]. The majority of women infected with *CT* are asymptomatic[3]. The US Preventive Services Task Force and the Australian Government recommend that screening for *CT* be offered to all women, aged 25years or less when attending for pregnancy booking[4]. In February 2020, a screening program was implemented within the National Maternity Hospital. An audit was performed to review rates of screening uptake, identify potential modifications to improve uptake, and to examine prevalence and management of STI within our population.

Women were included in this retrospective audit, performed over a six-month period from 1st March to 31st August 2020, if they were less than 25 years of age at booking. Patients were identified via booking lists generated by the data protection officer. Once identified, appropriate patient's online charts were reviewed to identify who availed of screening. For those who did avail, prevalence was measured. For those who did not, charts were reviewed to identify potential reasons for this.

In total, 175 women were included. Of these, 98 women availed of the screening test, an uptake rate of 56.25%. Of the women who availed (n = 98), five women (5.1%) tested positive for *CT*, 90 women (90.9%) tested negative and three swabs were invalid. No cases of Neisseria gonorrhoea or trichomonas vaginalis were diagnosed. Women who tested positive were treated as per British Association for Sexual Health & HIV guidelines.

With regards to those who did not avail of the screening test (n = 77), seven women (9.2%) had a 'virtual' booking visit, due to the ongoing COVID-19 pandemic. Five women (6.6%) booked offsite in the hospital's satellite clinics, where the screening program has not yet been implemented. Two women (2.5%) were screened in recent weeks and one woman (1.3%) declined the screening test.

Of the other 63 woman (81.8%) documentation was inconclusive with regards to why there was no screening test performed. This audit found an uptake rate of 56.2%, with a prevalence rate of 5.1% amongst those screened. A recent study in Australia, found this screening program to only be effective if uptake was 100% and prevalence was >5%[1]. In comparison, this study has far lower uptake rates. Reassuringly, however, prevalence rates are similar to those within other studies, at a rate which ensures the efficacy of the screening program.

From carrying out this study, the authors hypothesised that a large cohort of women were not offered this screening test, due to lack of awareness amongst staff members. This study has highlighted a need to increase awareness of this program amongst staff members and patients themselves. We plan to do this via infographics in the outpatients department and information accessible to patients via the hospital's website and social media platforms.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P475

Forty Percent of Children Attending General Paediatric Clinics in an Irish Hospital are Overweight

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Dear Sir,

Childhood obesity poses a significant threat to the health of children in Ireland. The Childhood Obesity Surveillance Initiative 2020 report found that 19.1% of school-aged children in Ireland were overweight or obese[1]. Overweight and obese children are at an increased lifetime risk of cardiovascular disease, respiratory disease, type 2 diabetes, osteoarthritis, and all-cause mortality[2]. Many of these complications are seen in adulthood but they are increasingly being diagnosed in children and adolescents. Children who are overweight are also at risk of low self-esteem, depression and emotional and behavioural disorders[3]. We carried out a study to assess the rates of overweight and obesity among the local paediatric population attending general paediatric clinics in an Irish hospital. Data was collected from thirteen paediatric clinics which took place between 4/11/20 and 2/12/20 in a hospital in the south east of Ireland. Most were general paediatric clinics; one was a paediatric endocrine clinic. Heights and weights of all attending children between two and eighteen years were measured and recorded by a paediatric nurse. Corresponding BMI centiles were calculated using the UK-WHO centile charts.

142 eligible patients attended clinic during this period. Data was available for 135 of these. 54 patients (40%) had a BMI on the 91st centile or above, categorising them as overweight or obese. 24 (17.8%) of patients were 91st-98th centile (overweight), 16 patients (11.9%) were 98th-99.6th centile (severely overweight/obese) and 14 patients (10.4%) were above the 99.6th centile (severely obese). Just two patients (1.5%) were less than the 2nd centile (underweight). To account for any over-representation of patients attending clinic for weight-related issues, we removed all endocrine patients, and those who had attended clinic with weight concerns. After these adjustments, 110 patients remained in the data set. 43 of these (39%) had a BMI on the 91st centile or above. Nine (8.2%) were 91-98th centile, 14 (12.7%) were 98th-99.6th centile and 10 (9.1%) were above the 99.6th centile.

Rates of overweight and obesity within the studied population were above national averages. It is possible that the study population is not a true representation of the local paediatric population given they were children attending a paediatric clinic; however, findings were little changed when children attending with a weight-related or endocrine issue were removed. It is also possible there may have been an overrepresentation of overweight children attending with other issues associated with obesity, such as asthma. Another consideration is that this study was carried out during winter, and during the Covid-19 pandemic. It is likely these factors could have had an effect on the paediatric population's activity levels which may have impacted on their measured weights. The pandemic and resulting school closures and stay-at-home notices have impacted significantly on lifestyle and activity over the past year[4] and are likely to have aggravated the childhood obesity epidemic.

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Established 1867

Issue: Ir Med J; Vol 114; No. 9; P476

Optimising Analgesia for Hip Fracture Patients Using Quality Improvement Methodology

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Dear Editor,

Hip fractures in older adults commonly occur after falls, particularly in Ireland, which has one of the highest standardised rates of hip fractures worldwide.[1] Optimal care of these patients is multifaceted but clearly defined, and includes a strong focus on comfort for this painful injury.[2] Regional anaesthetic techniques, such as the fascia iliaca nerve block, have been well-described as providing good analgesia, and can be administered in the emergency department without the side effects associated with systemic opioids.[3] In 2019, the Irish Hip Fracture Database (IHFD) began including preoperative nerve blockade in their dataset, with widespread regional variation noted in provision of this essential component of quality care.[4]

We convened a multidisciplinary quality improvement team and utilised the Institute for Healthcare Improvement's 'Model for Improvement' to address the low rate of block provision (14.8% of patients) at the emergency department of University Hospital Waterford, a model 4 acute hospital in the South/Southwest Hospital Group.

The primary project drivers were identified as early recognition of patients with hip fractures and early access to multimodal analgesia, with a focus on the implementation of an ultrasound-guided fascia iliaca block (FIB) service anchored within the emergency department. Three work packages to support this goal were developed: 1) generic training on analgesic options for older people and specific training on FIB provision, with supervised practice for middle grade Emergency Medicine (EM) NCHDs; 2) appropriate monitoring, documentation and governance controls to ensure safety of block provision; 3) supply and standardisation of required consumables.

The primary process measure was defined as the percentage of eligible patients receiving a FIB, with a goal of 90% provision set, tracked on a run chart over 23 weeks from August 2017 to January 2018.

Over the project period, 157 eligible patients with proximal femoral fractures attended UHW; of these 133 received a block (84.7%). These results were sustained over two years later, with a block completion rate of 73% for 2019.

Previous work to introduce analgesic protocols has either used a traditionally audited pre- and post-intervention approach, with the attendant risk that any change in practice will lapse once the study period ends, or has included analgesia as a component of a comprehensive care bundle, which can be slow and complex to implement. In contrast, this study uses an iterative quality improvement methodology to embed novel practice rapidly but sustainably within organisational culture. It thereby provides a practical template which other hospitals with low rates of regional nerve blockade, as reported by the Irish Hip Fracture Database, can implement to improve this aspect of the quality of care they provide to a vulnerable and growing cohort of patients. Lastly it demonstrates the utility of quality improvement methodology more generally within the Irish health service to drive meaningful change.

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Issue: Ir Med J; Vol 114; No. 9; P477

A Survey of the Potential Acceptance of a SARS-CoV-2 Vaccine Amongst People Living with HIV

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Dear Sir,

To date there have been over 380,000 cases of, and 5,200 deaths from COVID-19 in Ireland, and 90% of adults in Ireland are now vaccinated against SARS-CoV-2[1]. Studies suggest that people living with HIV (PLWH) are at increased risk of severe COVID-19[2]. The FDA has now approved a booster dose for those at risk of severe COVID-19, and other countries are likely to follow suit. Given the potential for increased severity of infection in PLWH, achieving a high rate of vaccination in this group is important. Our survey aimed to assess the level of vaccine acceptability among PLWH.

We carried out a survey among PLWH attending our clinic in the west of Ireland from 10/12/2020 until 01/04/2021. MCQs assessed sex, age, HIV control, comorbidities, years since diagnosis, annual influenza vaccination acceptance and history of COVID-19 personally or in a household member. A five-level Likert scale assessed participants' level of agreement with current government restrictions, and willingness to accept a SARS-CoV-2 vaccine. Chi-Square and Fisher's exact tests were used to assess for interactions between categorical variables.

51 people responded to the survey. 68.6% (35/51) were male. 56.9% (29/51) were born in Ireland, 17.6% (9/51) in another European country, 9.8% (5/51) in Africa, 7.9% (4/51) in South America, 5.9% (3/51) in North America, and 2.0% (1/51) in Asia. 49.0% (25/51) had been diagnosed with HIV for longer than 10 years, and 33.3% (17/51) less than 5 years. 92.2% (47/51) reported being on antiretroviral therapy with a suppressed viral load and CD4 count above 200. 11.8% (6/51) of patients reported hypertension, 9.8% (5/51) respiratory disease, 7.8% (4/51) obesity, 3.9% (2/51) diabetes, and 2.0% (1/51) cardiovascular disease. 21.6% (11/51) are current smokers. While not specifically recorded, we estimate approximately 200 patients attended the clinic during this time giving an estimated response rate of 25.5%.

94.1% (48/51) indicated they were in agreement with receiving a SARS-CoV-2 vaccine. Similarly, 96.1% (49/51) were in agreement with government restrictions. 94.1% (48/51) indicated that they accepted the annual influenza vaccine.

Unsurprisingly, those accepting of current government restrictions were also likely to accept SARS-CoV-2 vaccination ($p < 0.001$). However, none of the other recorded characteristics were associated with vaccine acceptance, likely as a result of small participant numbers and the very small number who were not agreeable to vaccination.

PLWH seem to be at higher risk of severe COVID-19[2]. It is unclear whether this is related to HIV infection itself or because of the higher prevalence of comorbidities associated with severe COVID-19 among PLWH[3]. Regardless, achieving high rates of vaccination in this population is important. Our survey demonstrates an overwhelming level of acceptability of SARS-CoV-2 vaccination among PLWH in the west of Ireland. We acknowledge the risk of sampling bias, and limited generalisability given the modest response rate. Nevertheless, the results are encouraging for the success of the vaccine rollout among this population.

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Established 1867

Issue: Ir Med J; Vol 114; No. 9; P478

The Impact of Covid-19 on Medical Professionals' Benzodiazepine Prescribing Practices

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Dear Editor,

Benzodiazepine (BZD) prescribing is common in Ireland[1]. Current guidelines recommend that prescriptions should be short term (< 4 weeks), yet long-term prescribing persists[2]. BZD misuse affects individuals, their families and society at large due to hospitalizations, substance dependence treatment and crime[3]. Despite having medical guidelines for appropriate prescribing, BZD management and withdrawal is, typically, poorly managed and has a reputation for being difficult for doctors and patients. Due to the Covid-19 pandemic health systems worldwide have had to adapt to meet varied health needs[4]. This study explores how Covid-19 has impacted medical professionals' prescribing practices of BZD's.

In early 2020, medical professionals working in General Practice, Addiction Services, Emergency Departments and Psychiatric Settings, in the HSE South/Southwest region of Ireland were recruited by HSE Addictions Services South. Focus groups were conducted to capture how medical professionals manage individuals who use BZD's in their practice and how Covid-19 has impacted upon their prescribing practices. Ethical approval was granted by the UCC, School of Applied Psychology ethics committee. In total, 6 online focus groups (52 participants) were carried out between July and November 2020.

Qualitative framework analysis surrounding the impact of Covid-19 identified three main themes: how telemedicine has sometimes reduced the pressure felt by medical professionals to prescribe benzodiazepines; the benefits of e-prescribing for prescription management; the effectiveness of the harm reduction approach that was implemented nationally due to Covid-19 restrictions. In relation to reduced pressure, one GP noted that: *"you can issue your script without the person standing over you or them being in your presence so it allows a bit more time and…a little more headspace to start a good change".* Participants also identified some difficulties resulting from Covid-19, including the uncertainty of patient well-being due to phone consultations and non-attendance. The importance of continuous evaluation of Covid-19's impact was evident across all 6 focus groups.

From this study, it appears there have been some positive changes to medical practitioners' prescribing practices, as a result of Covid-19. Thus, telemedicine, e-prescribing and harm reduction approach, have demonstrated some positive changes from the practitioners' perspective. The outcome for patients, though, was not explored in this study and remains unclear. Future research would benefit from continuous evaluation of the impact of Covid-19 on medical practice and the health of service users within Ireland.

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P479

Availability and Use of Assistive Listening Devices with Older Patients

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Age-related hearing loss is common with over one third of older adults in Ireland reporting hearing loss, increasing to over 50% in those aged over 75[1]. Hearing loss is a risk factor for cognitive impairment, dementia and depression[2], and associated with increased risk of medical error, social isolation, loneliness and decreased quality of life. It is particularly problematic in hospital care where hearing is essential to effective care and communication. This challenge is particularly acute for patients living with dementia and other cognitive disorders, where hearing loss is the most common co-morbidity. The current Covid-19 pandemic has further highlighted the problem due to the compulsory use of masks preventing lipreading and facial visual cues to assist with communication.

A very broad range of approaches to improving communication with patients with a hearing impairment, and in particular those with dementia, have been proposed[3]. Practical solutions, amongst others, include visual aids, signs, well-lit consultation rooms with minimal noise and distractions, writing, hearing aids, sign language. However, on acute hospital wards or in the emergency department, it can be very difficult to minimise noise to communicate with patients with hearing impairment. Assistive listening devices (ALDs) or hearing amplifiers can help in a variety of acoustic environments especially those with excessive noise such as hospitals or when social distancing is required between speaker and listener. ALDs are inexpensive personal technologies facilitating one-to-one conversations through a handheld microphone and headphones which amplify the sound that needs to be heard while filtering some background noise.

We conducted an online cross-sectional survey amongst consultant geriatricians and geriatric medicine trainees in Ireland to examine the practice of geriatricians caring for older patients with hearing loss and the availability of ALDs in hospitals. Of 54 geriatric consultants and trainees responding (25% response rate), over 90% (n=49) reported very often looking after older patients with hearing impairment. Alternative communication methods used included writing (90%, n=48), speaking louder (80%, n=43), assistive listening devices (46%, n=25), organising hearing aids (26%, n=14) and deferring a conversation (17%, n=9). Assistive listening devices have been used and found useful by 42 (78%) respondents. These devices were unavailable or available with difficulty in 74% of hospitals and 67% of geriatric medicine wards. Geriatricians refer patients with hearing impairment to audiology services routinely (15%) or occasionally (50%).

This survey highlighted that most geriatricians find ALDs helpful but that these devices are not readily available putting older patients at a high risk of breakdown in healthcare communications. The low rate of referral to audiology services is a matter of concern. These findings represent a lack of appropriate attention in a global context for such low-cost and effective supports – even audiology and ENT services in the UK report low availability of ALDs[4]. Overall, more screening, strategies and support (such as ready availability of ALDs and referral to audiology) are needed to identify and overcome barriers associated with age-related hearing loss due to its prevalence, associated risks, and evidence of effective strategies to support those affected[3].

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Irish Medical Journal
Established 1867

Issue: Ir Med J; Vol 114; No. 9; P480

Delayed Diagnosis in ANCA-associated Vasculitis Due to COVID-19 Pandemic

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Dear Sir,

The coronavirus disease 2019 (COVID-19) pandemic has had a profound impact on medical care. A significant strain has been placed on acute hospital systems to care for patients with COVID-19. However, the impact of delayed presentation, delayed diagnosis, and delayed treatment of other medical conditions may have an even greater burden in the longer term. As an exemplar of this phenomenon, we present two cases of antineutrophil cytoplasm antibodies (ANCA)-associated vasculitis (AAV) in which diagnosis was delayed due to initial suspicion of COVID-19. The clustering of AAV cases following COVID-19 lockdowns has been reported previously [1]. Delayed presentation has been suggested as an explanation for an absence of cases during lockdown followed by a compensatory increase post-lockdown [1]. However, we would like to suggest another mechanism whereby cases of AAV are initially diagnosed and treated as COVID-19 due to overlapping clinical features.

The first case was of a 65-year-old lady who presented with new onset right foot drop following a 6-week prodrome of coryzal features and sinusitis. She had developed otalgia, arthralgia, myalgia, and anosmia and was advised to isolate at home by her primary care physician. Laboratory testing demonstrated an acute kidney injury (creatinine 119 µmol/L), with an active urinary sediment, and elevated inflammatory markers (C reactive protein (CRP) 157 mg/L, erythrocyte sedimentation rate (ESR) 100 mm/hr). A polymerase chain reaction (PCR) test for SARS-CoV-2 was negative. Urinary protein creatinine ratio (uPCR) was elevated at 99 mg/mmol and red cell count (RCC) was 360 RCC/µL. c-ANCA was positive with a proteinase 3(PR3)-antibody titre of 177. A diagnosis of granulomatosis with polyangiitis (GPA) was made and treated with glucocorticoids and rituximab.

In the second case a 58-year-old lady presented with conjunctivitis, wrist and knee arthralgia, following a prodrome of fever, cough, sore throat and dyspnoea. CRP was 51 mg/L and ESR 47 mm/hr. She was initially reviewed over telehealth and a provisional diagnosis of COVID-19 and associated reactive arthritis was made and treated with prednisolone 20mg daily.

Chest radiograph demonstrated a right lower lobe opacity, computed tomography of the thorax demonstrated multiple cavitating pulmonary nodules. SARS-CoV-2 PCR was negative. Bronchoscopic evaluation showed severe nasal and post-nasal inflammation with subglottic stenosis and focal bronchial inflammatory change. Endobronchial biopsy demonstrated granulomatous inflammation and a subsequent c-ANCA was positive with a PR3 antibody titre of 50. A diagnosis of GPA was made and treated with glucocorticoids and rituximab.

Our cases were initially suspected of having COVID-19 and managed as such. The initial evaluation was limited due to pandemic restrictions. Persistent symptoms accompanied by negative SARS-CoV-2 PCR led to further investigation and diagnosis of AAV. Both cases have responded well to treatment and are in clinical remission. Our cases illustrate the potential for a delayed diagnosis of AAV during the COVID-19 pandemic even when patients present during their initial illness. Our cases have had no lasting negative consequences following the diagnostic delay; however, this is a very real concern in conditions such as AAV and we must remain vigilant for such presentations.

Keywords: COVID-19; ANCA-associated vasculitis; Delayed diagnosis

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