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Epistaxis in the Sars-CoV-2 Era

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Abstract

Introduction

Epistaxis was the third most common unscheduled ENT surgical intervention in Ireland in 2019. Otorhinolaryngologists are exposed to a high viral reservoir of Sars-CoV-2, as they are dealing with pathology in the upper respiratory tract. Risk analysis is required to minimise nosocomial transmission.

Methods

A prospective audit of epistaxis management in the outpatients at a tertiary hospital was undertaken pre pandemic. A retrospective review of patients records during the Sars-CoV-2 pandemic. Comparative analysis was utilised to assess outcomes.

Results

Pre Sars-CoV-2 analysis revealed 14 patients (70%) were manged with rigid endoscopy compared to one (5%) interpandemic. Cauterization treated 20 patients (100%) pre pandemic and four patients (20%) interpandemic. Nasal packing modality differed in that 13 patients (65%) were treated with Nasopore pre pandemic and 14 (70%) with Rapid Rhino interpandemic. This exhibited a paradigm shift in that 18 (90%) patients were managed conservatively with nasal packing interpandemic.

Conclusion

A paradigm shift in the management of Epistaxis during the pandemic has led to treatment which is less invasive, has less morbidity for the patient, requires less hospital admissions and lessens nosocomial transmission of the Sars-CoV-2. Further study is required given the advent of vaccines and development of various strains Sars-CoV-2.

Introduction

On the 11th of March 2020 the World Health Organisation declared Sars-Cov-2 a global pandemic[1]. Guidelines and recommendations were drafted in an attempt to reduce transmission. Treating epistaxis is invasive and healthcare professionals can be exposed to the Sars-CoV-2 virus via aerosolization of particles in the upper airway. Given this risk to both patients and healthcare professionals the management paradigm for epistaxis changed overnight.

Epistaxis has a lifetime incidence of 60%, with between 6% and 10% needing medical care[2]. It was the third most common cause of unscheduled ENT admissions, in 2019, in the Republic of Ireland[3]. The highest rates of Sars-CoV-2 incidence are in the elderly[4], with age contributing to the single greatest risk factor for severe disease. Concurrently age is a non-modifiable risk factor for cardiovascular disease, which too have been associated with a higher mortality in Sars-CoV-2 diagnosis[5]. The body of evidence supports a role for aspirin in both secondary and primary prevention of cardiovascular events in selected population groups[6]. There is a role for combination of both antiplatelet and anticoagulation including Warfarin and the newer non vitamin K utilising direct oral anticoagulants (DOAC), in treating stroke, atrial fibrillation and peripheral vascular disease[7], which can contribute to a higher risk of bleeding and epistaxis in the elderly.

The pathological result of Sars-CoV-2 diagnosis in the elderly and vulnerable populations is diffuse alveolar damage which may lead to scarring and fibrosis[8]. The mainstay of treatment for this is supplementary oxygen via multiple modalities, which can result in drying of the nasal mucosa causing bleeding[9]. Management of this bleeding should be performed in a pre-cautionary manner with full Personal Protective Equipment (PPE) to minimise transmission of Sars-CoV-2, as there is large viral reservoir in the upper respiratory tract[10].

The objective of the study is to compare pre and intra pandemic audits of epistaxis. This is to assess the best management options available, while limiting Sars-CoV-2 transmission to healthcare professionals and patients.

Methods

Pre pandemic auditing of adult epistaxis included a proforma, for the assessment of patients presenting with epistaxis. It included patients referred from the emergency department at our institution, in house consults and those referred from hospitals in the catchment area.

Recorded data included the history of presenting complaint as well as medical co-morbidities with emphasis on anticoagulation, antiplatelets, hypertension, previous episodes and trauma. Intervention and management modality of epistaxis were recorded. Finally admission and discharge status noted.

During the Sars-CoV-2 pandemic a retrospective audit of patients records who presented with epistaxis, was performed. The parameters of which were consistent with recorded data pre pandemic. The data was collated into comparable groups as evident in Tables 1 and 2. The contributing causative factors, comorbidities and treatment modalities were compared. ANOVA statistical analysis was utilised as to compare differences between two groups.

Results

Table 1: *Pre Sars-CoV-2 analysis proforma.*

Pre Sars-CoV-2 analysis	**Variable**	**N=20**
Patients		
Source of Patient	A & E: 65% (13)	Other: 35% (7) (wards, inter-hospital transfer)
Gender	Male: 80% (16)	Female: 20% (4)
Age	Mean: 64 years	Range: 16-89
Haemoglobin	Mean: 12.1	
Anterior or Posterior	Anterior: 60% (12)	Posterior: 40% (8)
Left or Right	Left: 75% (15)	Right: 25% (5)
Anti-coagulation	Yes: 40% (8)	No: 60% (12)
- ***Anti-coagulation Stopped?***	Yes: 12.5% (1)	No: 87.5% (7)
Anti-platelet	Yes: 30% (6)	No: 70% (14)
- **Anti-platelet stopped**	Yes: 0% (0)	No: 100% (6)
Anti-hypertensive	Yes: 40% (8)	No: 60% (12)
Previous episodes	Yes: 80% (16)	No: 20% (4)
- ***Number of previous episodes***	Mean: 5.1	
Trauma?	Yes: 10% (2)	No: 90% (18)
Treatment		
Tranexamic Acid	Yes: 15% (3)	No: 85% (17)
Nasal Packing	Yes: 70% (14)	No: 30% (6)
Nasal Cautery Silver Nitrate	Yes: 80% (16)	No: 20% (4)
Nasal Cautery Bipolar	Yes: 20% (4)	No: 80% (16)
Rigid Endoscope	Yes: 70% (14)	No: 30% (6)
Nasopore	Yes: 65% (13)	No: 35% (7)
Flowseal	Yes: 10% (2)	No: 90% (18)
Naseptin	Yes: 75% (15)	No: 25% (5)
Admitted?	Yes: 25% (5)	No: 75% (15)
Interventional Radiology Embolization	Yes: 0% (0)	No: 100% (20)
Sphenopalatine Artery Ligation	Yes: 5% (1)	No: 95% (19)

Twenty patients were assessed with our proforma (Table 1) over a 2-month period. In the pre pandemic cohort, 15 patients (75%) were treated in the outpatient's department with five (25%) requiring admission. Eight (40%) of the cohort were on anti-coagulant and 6 (30%) on anti-platelet medication, with one patient (5%) on dual antiplatelet therapy. Twelve patients (60%) had bleeding points identified anteriorly. Fourteen patients (70%) were managed by rigid endoscopy using cautery, 16 (80%) chemical, four (20%) electrocautery. One patient (5%) required surgery (Sphenopalatine Ligation) and one (5%) patient required anti-coagulant medication to be discontinued.

Table 2: *Sars-CoV-2 analysis proforma.*

Sars-CoV-2 analysis	**Variable**	**N=20**
Patients		
Source of Patient	A & E: 35% (7)	Other: 65% (13) (wards (6), inter-hospital transfer (7))
Gender	Male: 45% (9)	Female: 55% (11)
Age	Mean: 68 years	Range: 39-87
Anti-coagulation	Yes: 35% (7)	No: 65% (13)
Anti-platelet	Yes: 15% (3)	No: 85% (17)
Treatment		
Nasal Packing Rapid Rhino	Yes: 90% (18)	No: 10% (2)
Nasal Cautery Silver Nitrate	Yes: 15% (3)	No: 85% (17)
Nasal Cautery Bipolar	Yes: 5% (1)	No: 95% (19)
Rigid Endoscope	Yes: 5% (1)	No: 95% (19)
Flowseal	Yes: 5% (1)	No: 95% (19)
Admitted under ENT		No: 100% (20)
Admitted under another speciality	Yes: 30% (6)	
Remained in peripheral hospital	Yes: 35% (7)	
Interventional Radiology Embolization	Yes: 5% (1)	
Sphenopalatine Artery Ligation	Yes: 0% (0)	

During March and April of 2020, twenty patients were treated for epistaxis, no patient required hospital admission under the ENT team. There was no nosocomial transmission of the virus detected amongst ENT team members during this time period. A conservative approach to epistaxis treatment was employed as advocated by best practice guidelines at the time. Medical conditions exacerbating epistaxis were actively managed including hypertension, which was treated with antihypertensive medication by the emergency department. This and the management of Aortic heart valves, congestive heart failure, end stage kidney disease, necrotizing pancreatitis and an elevated International Normalised Ratio of 6, attributed for 6 (30%) of the patients in the study being admitted under another speciality for medical management. Non-absorbable nasal packing was utilised and clinical review in 48 hours for removal of packing was performed.

Referrals for epistaxis in this period included, 7 (35%) from the Emergency department, 6 (30%) from ward consultation and 7 (35%) from peripheral hospital telephone consults (none of whom required transfer, all were managed with nasal packing for 48 hours).

Fourteen patients (70%) underwent nasal packing with a Rapid Rhino® and were discharged with follow up review at 48 hours for removal. One patient (5%) required the use of rigid endoscopy, bipolar cautery and Floseal® due to recalcitrant epistaxis. Ultimately a Foley balloon catheter and Bismuth iodine paraffin paste gauze was utilised to achieve haemostasis. Five patients (25%) were discharged with biodegradable Naspore® in-situ. Of this cohort 7 patients (35%) were taking anti-coagulation and three (15%) on antiplatelet medication. Of the 6 patients admitted under the medical team four (20%) were on anticoagulation and one (5%) on antiplatelet medication.

There was a significant differences in the utilization of rigid endoscopy (70% pre pandemic and 5% interpandemic), bipolar and chemical cauterization (100% pre pandemic and 20% interpandemic) and nasal packing modality (65% Nasopore pre pandemic and 70% Rapid Rhino interpandemic) when comparing pre- pandemic and pandemic management of epistaxis. Notably There were no patients admitted for the management of epistaxis under the ENT team during the period recorded during the pandemic, compared to the five patients admitted pre pandemic. Statistical analysis of both arms with ANOVA was performed as the data is categorical. There was no significant difference exhibited between the groups, given the small numbers within the study this is to be expected.

Discussion

An overall reduction in hospital admissions for the management of epistaxis under the ENT team was exhibited with employment of more conservative measures as recommended by such bodies as ENT UK, when addressing haemostasis. This advice was on the basis that higher loads of Sars-CoV-2 have been found to accumulate in the nasopharynx in those testing positive for the virus[11]. Given the close proximity required by Otolaryngologists to assess and treat bleeding in the upper airway the propensity for transmission of Sars-CoV-2 is high. Droplet transmission involves exposing an entry point, such as mucosa (nose and mouth) or conjunctiva, to potentially infective respiratory droplets (typically > 5–10 µm in diameter) produced by someone having respiratory symptoms within a 1 meter proximity[12]. Utilising PPE (FFP3 masks, goggles, gloves and plastic overalls) when assessing a patient with epistaxis, was performed during the pandemic to reduce this transmission risk.

PPE and guidelines in epistaxis management during the pandemic were adhered too for all patients as studies have shown that SARS-CoV-2 can be detected in the saliva of asymptomatic persons[13]. Medical professionals caring for patients with Sars-CoV-2 are at high risk of contracting the infection, given its high virulence and the occurrence of contagion from asymptomatic individuals[14]. In Ireland, 8144 of the 25,333 (32%) cases of confirmed Sars-CoV-2 relate to healthcare workers. Of the 8018 healthcare workers infected up to May 30th 2020, 88% got the virus in a healthcare setting[15].

Therefore considering all patients presenting with epistaxis to be Sars-CoV-2 positive, is the safest approach to treatment. Currently there is no point of care test in an emergency setting which can confirm the patients Sars-CoV-2 status. Therefore only an experienced clinical team with proper personal protective equipment should be involved in the treatment of epistaxis[16]. FFP3 (Europe) or N99 (US) masks, which allow a minimum 99% filtration, must be preferred to any other option[17]. Utilization of goggles, gown and gloves with pre and post procedural hand washing are advocated to reduce transmission.

The pathway outlined by ENT UK offers a guideline for acute epistaxis management, via referral from the emergency department. Consideration should be given to the fact that some emergency departments may not stock or be familiar with insertion of bio-degradable nasal packs such as Nasopore® or haemostatic agents such as Floseal®. It recommends insertion of a Rapid Rhino® pack and administration of Transexamic acid with outpatient clinical review in 48 hours for assessment.

The conservative approach employed during the Sars-CoV-2 arm of the study resulted in a significant reduction in hospital admissions under ENT and preserved acute hospital beds for those requiring treatment for Sars-CoV-2 pneumonitis. Radiological embolization also ensured reduced viral transmission, given there was no need for a general anaesthetic and intubation. Not all centres have a interventional radiology department and therefore sphenopalatine artery ligation should be delayed until Sars-CoV-2 testing has been performed[18].

The ability to ensure haemostasis with non-absorbable packing alone during the pandemic was achieved in 85% of our patients. This is reassuring given that several studies show that nasal endoscopy with cautery produced significant amounts of airborne aerosols[19]. Therefore limiting the use of rigid endoscopy in the department during the first wave of the pandemic due to its high risk of viral transmission[20], reduced the possibility of further nosocomial spread. Peripheral hospital management of advice to insert a nasal pack and for removal in 48 hours, negated the transfer of 35% of patients during the pandemic. These measures reduced the necessity for admission, hospital transfer and limited the exposure to healthcare professionals and other patients.

The Sars-CoV-2 pandemic has changed the management of Epistaxis. A recent audit of Epistaxis management during Sars-CoV-2 pandemic, that included 2,631 cases across 83 centres in the United Kingdom, was reported. There was a significant reduction in the insertion of non-dissolvable packs. If initial measures, such as the Hippocratic Method and reversal of medical co-morbidities fail, the use of dissolvable haemostatic packs such as Nasopore® and haemostatic agents such as (Floseal ®, Surgicel ®) and Tranexamic acid were advocated, resulting in only a 6.8% admission rate and a re-presentation rate of 20%[21]. Re-presentation was more likely, if non-absorbable packs were inserted in the Emergency Department, if nasal cautery had failed and the patient had a previous history of epistaxis or were on anti-platelet therapy.

Our study revealed a significant decrease in the admission rate and a reduction of the requirement for rigid endoscopy and nasal cautery. Non-absorbable packs were utilised in our practice as our emergency department are unfamiliar with the absorbable brands. Based on the UK Audit we recommend a change of practice to the use of dissolvable haemostatic agents as the first choice for intranasal tamponade and would concur that insertion of non-dissolvable packs should be avoided in the Emergency Department, unless the above measures fail.

There are limitations in the study as those given Co-Phenylcaine® were not recorded as a means to conservative haemostasis, neither was the length of time or number of attempts of the Hippocratic method for haemostasis noted. Transexamic acid administration in the interpandemic cohort was not recorded either. The sample size is limited.

Sars-CoV-2 has forced a paradigm shift in the management of Epistaxis, which is less invasive, has less morbidity for the patient, requires less hospital admissions and lessens nosocomial transmission of the Sars-CoV-2 virus to healthcare staff and patients. Further study is required given the advent of vaccines and development of various strains of Sars-CoV-2.

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

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