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Challenges in the Management of Epistaxis with Limited Resources Pondicherry India, 2016

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Abstract: ***Background: Epistaxis is a challenging and common condition. The lifetime incidence of epistaxis is difficult to determine.The management of epistaxis has evolved significantly in recent years. This study was conducted with limited resource to identify the etiological profile and to determine outcome of treatment of these patients. Methods: We conducted cross sectional survey among epistaxis patients attending health facilities using convenient sampling. Initial assessment includes haemodynamic status, type and severity of bleeding. All patients underwent radiological evaluation and Diagnostic nasal endoscopic (DNE). All patients were initially treated conservatively and surgical intervention is considered only when conservative means failed . Systemic and local risk factor estimation was done in a comprehensive examination. .Univariate and stepwise regression analyses were done to identify the independent risk factors associated with the presence and severity of epistaxis. We calculated adjusted odds ratio with 95% CI to identify the factors associated with diabetic retinopathy. Results: The prevalence of epistaxis was 1.4% in the study population. It was more common among males. The commonest age group effected was more in the fourth decade of life. The commonest etiological factor was trauma (43.2%), hypertension (23.5%), infectious conditions (11.7%), D.N.S. with spur (8%) ,nasal polyp (7.4) and idiopathic causes (6.2%) . The causes for epistaxis in the first and second decades were trauma, infection and septal abnormalities. Hypertension, trauma and infected polypoidal mass accounted for the cases from fourth decade onwards. About 55.6% of patients had anterior nasal bleeding, 21.6% had posterior bleeding and 22.8% had both. No difference between unilaterality and bilaterality was noticed. Among cases with unilateral bleeding right sided bleeding was more than left sided Nearly 86% of the patients were managed by conservative measures like medical treatment (42%), cautery (.05%), anterior nasal packing (15.4%) and posterior nasal packing (9.3%) .About 4% of the patients required surgical intervention. The main interventions were septoplasty (6.2%), nasal bone fracture reduction (6.8%), excision of bleeding polyp with electrocautery of the base (3.7%) and polypectomy with FESS (3.7%). Conclusion: Most of the underlying causes of epistaxis are preventable. A clearer understanding of the causes, treatment and outcome of these patients is essential for establishment of preventive strategies as well as treatment guidelines***

1. Introduction

Epistaxis is one of the most common ear, nose and throat (ENT) emergencies to present to local hospital [1]. Nosebleed are usually a harmless disease, but it can sometimes be life threatening [2,3]. The aetiology is unknown in many cases. The management of epistaxis has evolved significantly in recent years, including the use of nasal cautery and packs. Successful treatment requires knowledge of nasal anatomy, and potential risks and complications of treatment [4]. The management of Epistaxis can be challenging. The lifetime incidence of epistaxis is difficult to determine, but has been reported to be as high as 60% [2, 3]. However, only a very small proportion requires specialist management. Many patients self-manage this condition as it is often spontaneous and self-limiting. The prevalence is increased for children less than 10 years of age and then rises again after the age of 35 years [4]. Generally, males are slightly affected than females until the age of 50, but after 50 no difference between sexes as reported [2,4].

The nose has a rich vascular anatomy with multiple anastomoses. The arterial supply arises from branches of both the internal and external carotid arteries. The ethmoidal arteries, branches of the internal carotid, enter the nose superiorly and supply the upper extremes of the septum and lateral nasal wall [5]. The facial and the internal maxillary artery are the two branches involved in the supply of the nasal cavity and are part of the external carotid. The internal maxillary divides into six branches and includes the greater palatine and sphenopalatine arteries (SPA) [5,6]. These contribute to Keisselbach's plexus and supply up to 80% of the nasal vault. The facial artery is the second major branch of the external carotid to supply the nose, which also contributes to Keisselbach's plexus. Epistaxis is most commonly classified into anterior or posterior bleeds. This division lies at the piriform aperture anatomically. More than 90% of episodes of epistaxis occur along the anterior nasal septum, which is supplied by Keisselbach's plexus in a site known as the Little's area. The Keisselbach's plexus is an anastomotic network of vessels located on the anterior cartilaginous septum [6, 8]. It receives blood supply from both internal and external carotid arteries.

Depending on its course, it is possible to distinguish epistaxis with local causes and symptomatic nosebleeds with a generalized cause [9]. It is also possible to classify epistaxis in a primary or idiopathic spontaneous and a secondary form, for example as a result of trauma, surgery or anticoagulant overdose [10,11]. The Local causes of epistaxis include trauma, neoplasia, septal abnormality, inflammatory diseases and iatrogenic causes. Local trauma is common among children who present with post-digital trauma or irritation. Causes such as neoplasia are uncommon [11]. However, eliciting significant signs and symptoms is

important. Uncommon causes, such as neoplasia, need to be ruled out through a thorough history and examination.

Approximately 10% of episodes of epistaxis are posterior bleeds. Posterior bleeds are most commonly arterial in origin. It presents with a greater risk of airway compromise, aspiration and difficulty in controlling the haemorrhage [12]. Epistaxis can also be divided into primary or secondary. Primary causes account for 85% of episodes and are idiopathic, spontaneous bleeds without any notable precipitant. Bleeds are considered secondary if there is a clear and definite cause (eg trauma, anticoagulant use, post-surgical)

Most of the underlying causes of epistaxis are preventable [9,11,12] . A clearer understanding of the causes, treatment and outcome of these patients is essential for establishment of preventive strategies as well as treatment guidelines [3,9,10]. Such data is lacking in our environment as there is no local study which has been done on the subject. This study was conducted in our setting to identify the etiological profile and to determine outcome of treatment of these patients. The results of this study will provide basis for planning of preventive strategies and establishment of treatment guide.

2. Methodology

2.1 Study Population

Our study population were patients who presented either to emergency department, ENT OPD and referral from other outpatient units of healthcare facilities in the age group between 18 & 45 years for any of their health needs.

2.2 Study design

We did a facility based cross-sectional survey at Health facility between January 2015 to March 2016.

2.3 Analysis

Data was expressed in the form of frequencies and percentages. We calculated the prevalence infection and various other co-morbid conditions with 95% CI. We also analysed the various risk factors for epistaxis. To measure the strength of the associations OR was calculated and the 95% confidence interval (CI) tested to ascertain whether the results were statistically significant. We computed unadjusted and adjusted ORs with 95% CI using the logistic regression method. We adjusted each of the risk factors for age in separate models and used Epi-Info version 3.5.3 for data entry and analysis.

2.4 Sample size and Sampling Procedure

The sample size was based on the assumption of 15% prevalence,5% absolute precision and at 95%confidence interval with 5% non-response [8]. Selection of participants were made on the basis of consecutive sampling of cumulative cases over one week per facility in order to obtain the sample size. The principal investigator and two trained investigators collected the data. Participants were recruited after sharing the information about the purpose of the study in their local language. All patients who indicated willingness to participate in the study and gave written informed consent were included in the study. Subsequently their consent was obtained alongside a witness in case of illiterates. We used a structured questionnaire to collect data regarding sociodemographic details, behavioural risk factors and history of other diseases. All participants answered a self-administered questionnaire which included information and risk factors for epistaxis and blood borne diseases. Physical examination was performed to evaluate general health condition of each patient. Initial assessment includes hemodynamic status, type and severity of bleeding. If there was signs of excessive blood loss and if patient were in a state of shock, initial steps were taken to stabilize as per Advanced Trauma Life Support (ATLS) principle and simultaneously control of epistaxis. All patients underwent radiological evaluation and Diagnostic nasal endoscopic (DNE). All patients were initially treated conservatively and surgical intervention is considered only when conservative means failed. Conservative (non-surgical) treatment includes cauterization of the bleeding site using electrocautery, anterior nasal packing and posterior nasal packing. We use standard tools for screening assessment of health status after translating into local language. Supervision of data collection by field investigators was done by the principal investigator.

2.5 Protection of human subjects

We obtained approval from the Institutional Ethics Committee of the Indira Gandhi Govt. General Hospital and Post Graduate Institute, Puducherry as well as written informed consent from all the participants. We referred patients with moderate to severe epistaxis for further evaluation by endoscopic skull base surgeon and for interventional radiologist.

3. Results

The prevalence of epistaxis was 1.4% in the study population. It was more common among males. The commonest age group effected was more in the fourth decade. The commonest etiological factor was trauma (43.2%), hypertension (23.5%), infectious conditions (11.7%), D.N.S. with spur (8%), nasal polyp (7.4) and idiopathic causes (6.2%) Fig [1, 2]. The causes for epistaxis in the first and second decades were trauma, infection and septal abnormalities. Hypertension, trauma and infected polypoidal mass accounted for the cases from fourth decade onwards. About 55.6% of patients had anterior nasal bleeding, 21.6% had posterior bleeding and 22.8% had both. Among the treatment options 86% of the patients were managed by conservative measures like medical treatment (42%), cautery (.05%), anterior nasal packing (15.4%) and posterior nasal packing (9.3%) Fig 3. Nearly 34% of the patients required surgical intervention. The main interventions were septoplasty (6.2%), nasal bone fracture reduction (6.8%), excision of bleeding polyp with electrocautery of the base (3.7%) and polypectomy with FESS (3.7%)

The mode of onset is usually acute and frequency of

bleeding is more than 5 times per day usually. There was no difference between unilateral and bilateral bleed. Among cases with unilateral bleeding right sided bleeding was more common. The associated symptoms are nasal obstruction, nasal discharge, anosmia, headache, fever, falling of crusts. In some patients there are no associated symptoms. Most of the study cases didn't have any associated systemic disorders except for a few percentages having hypertension and bleeding disorders. Thrombocytopenia as a cause of epistaxis could be accounted only in few cases as most of the study cases have normal platelet count. As only few cases have profuse bleeding, the percentage of cases with severe pallor was also few. Posterior Rhinoscopy is usually non-informative but may show mass, or atrophic changes of the turbinates or discharge apart from bleeding. The prognosis is good in majority with no recurrence, but a few may have repeated severe attacks especially in those with bleeding diathesis and uncontrolled hypertension mostly in patients who were treated with medical treatment alone. There was no mortality due to epistaxis in this study.

4. Discussion

Epistaxis is estimated to occur in 60% of persons worldwide during their lifetime, and approximately 6% of those with nosebleeds seek medical treatment [2, 3]. The prevalence is increased for children less than 10 years of age and then rises again after the age of 35 years [4]. Generally, males are slightly affected than females until the age of 50, but after 50 no difference between sexes as reported [2,4]. In the present study, the incidence of epistaxis which is comparable to the studies by Juselius et al and Varshneyetal [13,14] . Epistaxis are more common in fourth decades and the study by Amusa et al. suggest 40% cases up to the third decade and 60% cases from fourth decade onwards are effected[15]. Varshney et al. also reported 73% cases in the fourth decade and above [14]. Epistaxis can be a manifestation of multiple local and systemic disorders of the body. Contrary to our results, in a study by Awan et al most of the patients were from paediatric age group[16]. Our study results showed a bimodal presentation of epistaxis among the patients, which is has also been reported in some literature. In the earlier studies, trauma accounts for only 2.6% of the cases. The incidence in the present study, 42%, is definitely on the higher side. Recent study by Amusa et al. showed traumatic epistaxis in 70.9% of cases. This can be explained on account of higher accident rate due to increase in the number of vehicles and bad roads and also increase in number of assault cases. The other major cause of epistaxis is hypertension which accounts for 24% of the cases. Most patients belong to the age group of 40 years and above. Hypertension was a major etiological factor in studies conducted by Juselius et al. (47.3%), Monjas et al. (56%), Varshney et al. (31.8%) [13, 14, 17]. This due to the increase in lifestyle diseases. Epistaxis as a result of infection due to chronic adenoiditis, rhino sinusitis, atrophic rhinitis, rhinosporidiosis and septal spur and results of our study were comparable to the study by Varshney et al [13]. Majority of cases have anterior epistaxis mainly from Little's area and lateral wall, probably of traumatic nature and those with posterior epistaxis had hypertension as the main cause which was as similar to the study by Hussain et al[18].Most patient were treated conservatively as in accordance with Phillip et al [19]. Study where 83% of the patients were treated successfully by non-interventional means. Similarly in the study by Urvashi et al. almost 99% of cases were managed by conservative measures like cautery, anterior and posterior nasal packing

Conservative management at the health facility usual starts with Application of topical spray such as 5% lignocaine with 0.5% phenylephrine to both nostrils [20]. Alternatively, an unravelled cotton ball can be soaked with the spray and carefully inserted into the nasal cavity [21]. The application of topical sprays reduces haemorrhage to allow for better visualisation and analgesia for possible cautery or nasal packing. Posterior bleeds are challenging and need to be considered if an anterior bleeding site is not visualised. The major sign include bilateral bleeding from both nostrils, or blood may be dripping down the posterior pharynx .Nasendoscopy can be performed by any ENT specialist, with a rigid endoscope, and the source of bleeding can be identified in a further majority of the cases [22]. Endoscopy allows for inspection of the entire nasal cavity including the nasopharynx to examine for posterior bleeds [23]. Management of an anterior bleed can often be performed safely in primary care facility with Options including cautery or nasal packing if direct pressure fails to stop the bleeding. Cautery sticks are impregnated with silver nitrate, which reacts with the mucosal lining to produce a chemical burn to reduce bleed [24]. Utmost care must be taken during bilateral cautery to prevent septal perforation after cauterization, patients should then be placed on a nasal moisturiser such as Kenacomb or paraffin. The nasal packs work by applying direct mechanical pressure on the site of the bleeding. Most Traditional methods include use of lubricant or antibiotic-soaked ribbon gauz. The rapid Rhino has an inflatable balloon coated in a compound that acts as a platelet aggregator[.21]The balloon is inflated after insertion, to tamponade bleeding, and can be left for up to 3–4 days[1]. Posterior packing may be required if the bleeding continues despite anterior packing. Commonly used posterior packs include balloon catheters. In combination with an anterior pack, a posterior pack is placed to tamponade the area of choanae and sphenopalatine foramen.[1]. The Foley catheter can also inserted along the floor of the nasal cavity into the posterior pharynx. The balloon is then inflated and retracted anteriorly to sit in the nasopharyngeal space [22] A clamp is used to secure the device. The clamp and Foley's catheter must be regularly reviewed by the nursing staff as there is a risk of pressure necrosis on the nasal tip. It is recommended that insertion of a Foley catheter be performed only by a clinician who has been trained in this skill. The use of nasal packs can have complications. Oral antibiotics are usually prescribed as a prophylactic measure against toxic shock syndrome while the packs are in situ [24]. This condition is rare, there is little convincing evidence in the literature around the use of prophylactic antibiotics. The complications of nasal packs include acute sinusitis and obstruction of the nasal airway, leading to sleep apnoea or hypoxia [24].Patients with posterior packing, as well as bilateral packs, are at a higher risk of hypoxic episodes, myocardial infarction, cerebrovascular accident and death. [25] .If epistaxis continues despite packing, surgical options may be considered. There are three main types of surgical options:

external carotid artery ligation, internal maxillary artery ligation or SPA ligation [24]. The decision around which artery to ligate will depend on the site of bleeding and its likely source. The aim will be to ligate as close as possible to the site of bleeding. Endonasal ligation of the SPA is the most specific and currently the most widely used technique [24]. Studies have shown that ligation of the SPA can control 98% of posterior epistaxis [26].The major challenge is recognising variations in the anatomy is important in the success of this procedure. Risks with this procedure are rare, but include blindness, decreased lacrimation, local infection, infraorbital nerve injury, oroantral fistula, sinusitis and epiphoria [25].

Angiographic embolization in epistaxis is another method of controlling bleeding. Access to the vascular system through a femoral punch leads to identification of the bleeding point. The success rate of this procedure is high, although not without risk. Major complications such as Cerebrovascular accidents and blindness can occur in up to 4% of cases [1].It remains a strong alternative to SPA ligation in posterior epistaxis for patients who are medically unfit for general anaesthesia, or who have had a failed artery ligation.

patients need to be educated about proper first aid, should they have a recurrence of epistaxis. Patients should should be advised to apply digital pressure at the cartilaginous part of the nose for a minimum of 10 minutes without letting go and advised to sit up, lean forward and use an ice pack,. If the cause of the bleeding is unknown or suspicious, appropriate investigations and referrals should be sought immediately.

5. Limitation

The limitations of this study include self-selection bias as the participants were selected from the health facilities. Low levels of education/awareness and higher median age could have contributed to high levels of error in recall. Information bias could possibly have crept in while collection of information on smoking, alcohol, health facility resources and providers attitudes from the patients. To reduce these biases we trained the field workers to appropriately prompt the patients and elicit information. Identified risk factors were based on just point estimation; therefore, a causal relationship with epistaxis could not be proved. In addition, a considerable limitation of this study pertains to the relatively small sample size.

6. Conclusion

Management of epistaxis involves a wide range of strategies and treatment options. However, it is important to appreciate when to correctly employ the different interventions. It is important to involve an experienced ENT surgeon who can intervene either with endoscopic suction cautery or with Endoscopic spenopalatine artery ligation in the operating room. Recent literature advocates earlier surgical intervention with Endoscopic spenopalatine artery ligation for such cases due to its simplicity, high success rate, low risks, and avoid reoccurrence. A clear understanding of the causes, treatment and outcome of these patients is essential for establishment of treatment guidelines and cost effective preventive strategies.

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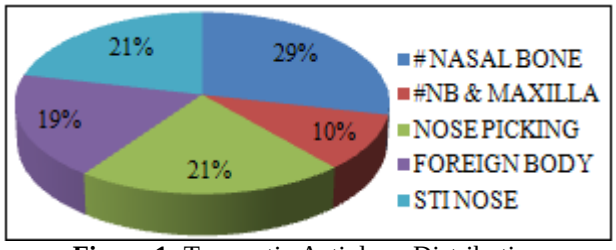

Figure 1: Traumatic Aetiology Distribution

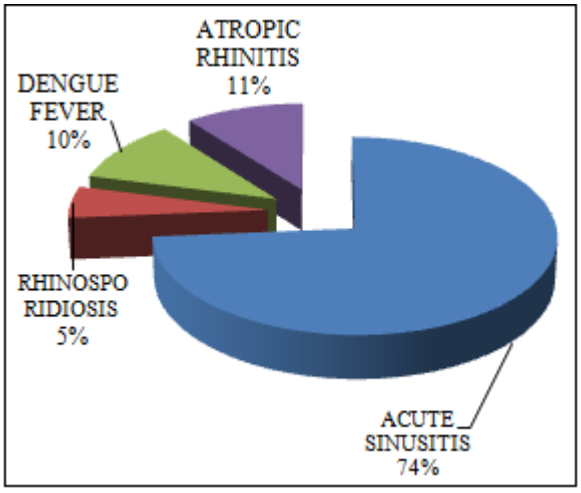

Figure 2: Infection Aetiology Distribution

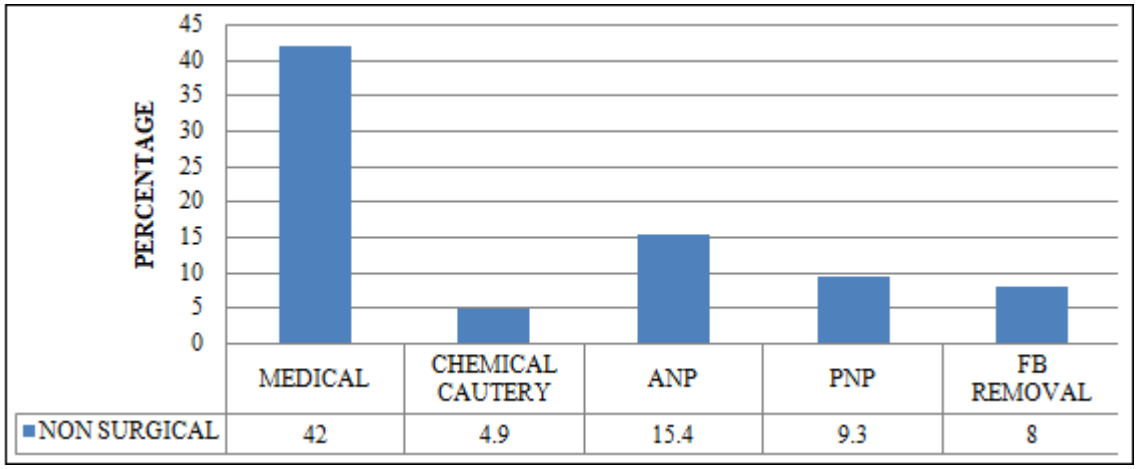

Figure 3: Non Surgical Methods.