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RESEARCH ARTICLE

A PROSPECTIVE OBSERVATIONAL STUDY TO SEE THE EFFECTIVENESS OF NON SURGICAL METHODS TO CONTROL EPISTAXIS, WHICH CAN BE UTILISED IN MINIMALLY EQUIPED SET UPS AS IN OUR PERIPHERIES

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ABSTRACT

Background: Epistaxis is most common E.N.T. emergency. The present study is a prospective observational study to study effectiveness of non surgical methods to control epistaxis, even in minimally equipped set ups in our peripheries.

Objective: To evaluate and compare the outcome of various treatment modalities.

Methods: After taking history and through clinical and E.N.T. examination, baseline investigations, diagnostic nasal endoscopy, radiological examination wherever needed reassurance and non surgical methods were sufficient to effectively control epistaxis in most cases. Surgical methods were needed in less than 4% of cases in our set up.

Results: In our study, Non- surgical procedures were the main stay of treatment of epistaxis in 96.5% of cases. Surgical measures account to 3.5%. The overall success of treatment was 85%.

Conclusion: We concluded that epistaxis affects all age groups and both sexes, with males more than females. Non-surgical treatment is still useful to arrest nasal bleeding, safe and cost effective. Surgical intervention should be the last resort of treatment.

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INTRODUCTION

Epistaxis has been referred to as the albatross of Otolaryngology. It is the most common rhinologic emergency experienced by otolaryngologists. It cannot only affect the haemodynamics but may cause great anxiety to patients and their relatives. Epistaxis is a common affliction occurs in up to 60% of general population at sometime of their life. **Smith et al. (1995)**, with a prevalence rate of 10 to 12% (Shaheen 1967). 80% bleeding arise from the Keisselbach's plexus and they are called as anterior epistaxis (**Varshney and Saxena, 2005**). It is one of the common presentations to an ENT surgeon (**Shaheen, 1967; Al Khtoum and Al Rooson, 2008**). The most common causes (**Moreau et al., 1998**) are nose picking, trauma, infection, hypertension, etc. Different modalities of treatments are available in the out patient department settings. Among these, the conservative method and chemical cautery with silver nitrate are commonly followed. Various Systemic causes responsible like hypertension, hypertension with diabetes, chronic renal failure, cirrhosis with portal hypertension, acute hepatitis, aplastic anaemia, idiopathic thrombocytopenic purpura. Traumatic epistaxis is more common in young individuals <35 years.

Trauma has been proven to be most common cause of epistaxis, non-traumatic epistaxis is more common in older patients (over 50 years of age) and may be due to systemic ailments like hypertension and atherosclerosis, metabolic and hormonal disorders. Hypertension as such is a commonest cause of epistaxis in adults and it also leads to arteriosclerosis of vessels lying under the delicate mucosa which are unable to retract and clot easily, when damaged and cause bleeding (**Myrian Marajo Dal et al., 2009**). Organ failure, neoplastic conditions, inflammation, or environmental factors (temperature, humidity, altitude) attribute to the causes of epistaxis. For patients on anticoagulant therapy, it is important to recognize that the risk of bleeding increases as the international normalized ratio (INR) increases e.g; warfarin is used in the primary and secondary prevention of stroke in patients with atrial fibrillation, arterial, venous thrombo-embolism and in conjunction with prosthetic heart valves. Antiplatelet medication is widely used for various forms of cardio-vascular disease, both in primary and secondary prevention (**Smith et al., 2011**). Epistaxis is the most common symptom in patients with Von - Willebrand's disease (**Lee et al., 2004**). Both conservative and surgical treatment modalities have been used in the treatment of epistaxis. Conservative management conventionally includes

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cauterization of the bleeding site, anterior nasal packing and posterior nasal packing. The present study has been done in 190 patients of epistaxis with the purpose of assessing the efficacy of these various conservative treatment

MATERIALS AND METHODS

The present study is a prospective observational study conducted in the postgraduate department of E.N.T. for a period of one year commencing from November 2010 to October 2011. The study included 190 patients attending / admitted in the Department of E.N.T. with epistaxis diagnosed clinically. All cases underwent a detailed history taking, a through clinical, systemic and local examination of the nose, throat and ears. After the bleeding was controlled, the patients were subjected to various biochemical investigations including the haematological parameters. The Prothrombin time (PT), activated partial thromboplastin time (aPTT) estimation, factor VIII, IX were done in selected cases. Radiological evaluation including X-ray and Contrast enhanced CT- scan were done in cases of Benign/malignant tumours. Biopsy was taken to diagnose in case of benign tumours like inverted papilloma, excluding angiofibroma. Diagnostic nasal endoscopy was performed to locate the site of bleeding in selected cases wherever indicated.

Local treatment included assurance, nasal decongestants, cauterization of bleeding points with electrical /chemical (silver nitrate 30%) cautery when bleeder was visualised. Nasal packs were also used to control epistaxis. The nasal packs were of gauze impregnated with antibiotic ointment and medicated lubricants. Concurrent treatment also included intravenous administration of fluids, blood transfusion, sedation which was tailored as per the patient's haemodynamic status and specific treatment of aetiological conditions. Nose was prepared with 4% lignocaine and adrenaline solution (5:1) packs for 10 minutes, followed by Nasal Endoscopy to localize the site of bleeding. In children 2.7mm nasal endoscope was used and in adults 4mm size nasal endoscope was used to locate and cauterize bleeding point with the help of bipolar electric cautery. Various non- surgical procedures employed to control bleeding include

Chemical cautery: using Silver nitrate (30%) and was procedure of choice for a visible bleeding point on the septum whereas electro-cautery was safer if there was bleeding point on the turbinates. However in patients with generalized ooze or profuse bleeding, anterior nasal packing (ANP) was done. For *Anterior Packing* the nose was cleared of blood clots. About one metre gauze (2.5 cm wide in adults and 1.2cm in children) was required for each nasal cavity. First, few centimetres of gauze were folded upon itself and inserted along the floor and then the whole nasal cavity was packed by layering the gauze from floor to the roof. Pack was removed after 48-72 hours. Systemic antibiotics were given to prevent sinus infection and toxic shock syndrome. Gelfoam/merocel pack was used effectively to control mucosal ooze, especially in patients with bleeding diathesis or secondary to systemic illness, to minimize idiopathic trauma that may be associated with nasal packing.

Posterior Nasal Packing (PNP): was done in patients who were not controlled with anterior nasal packing and bleeding

posteriorly into the throat. A postnasal pack was first prepared by tying 3 silk ties to a piece of gauze rolled into the shape of a cone. A rubber catheter was passed through the nostril into the oropharynx and its end brought out from the mouth. Ends of the silk threads were tied to it and catheter withdrawn from the nose. Pack, which follows silk threads, was guided into the nasopharynx with the index finger. Anterior nasal cavity was now packed and the silk threads were tied over a dental roll. The third silk thread was cut short and allowed to hang in the oropharynx. It helped in easy removal of pack later. Patients requiring posterior nasal pack were hospitalised. The successful treatment was defined as:

- No recurrent epistaxis under observation following pack removal at the time of discharging the patient.
- No readmission with epistaxis within 24 hours.

Follow-up schedule was tailored according to initial presentation, aetiology, management protocol and data collection was done for each patient upto six months/till completion of study period.

RESULTS

In our study, we found that out of 190 patients, maximum number of patients were 43(23%) in the pediatric age group of less than 10 years. There were 152 males, 38 females and male: female ratio was 4:1. The average age was 35 ± 21.37 years (range 1 – 82 years) with standard deviation =21.37 and can be because of higher affliction in younger population as shown in (Table 1). Nasal endoscopy was not required in 82 (43.5%) patients as the bleeding sites were located with anterior rhinoscopic examination alone and were taken care of. When anterior rhinoscopy was combined with nasal endoscopy side of bleeding was determined in all 190 patients. (Table 2) Cauterization included 54(28.5%) patients, of which 39(20.5%) were treated by chemical cautery, 15 (8%) were treated with electric cautery. Anterior nasal packing includes ANP with antibiotic impregnated gauze pack 69 (36%) and merocel packing 10 (5.5%).

Non- surgical procedures including anterior nasal packing, posterior nasal packing, cauterization and observation with medication were the main stay of treatment of epistaxis in 96.5% of cases. Of this, cauterisation and anterior nasal packing (ANP) were most common non-surgical measures accounting for 28.5% and 41.5% respectively. Surgical measures like ligation and surgical excision of tumour account to 3.5%. Twenty eight cases failed to respond to single procedure, 10 were cauterised, anterior nasal packing was done in 11 patients and posterior packing in 7 patients. The overall success of treatment was 85%. Success rates for various treatment modalities are shown in (Table 4). The successful treatment was defined as no recurrent epistaxis under observation or following pack removal at the time of discharging the patient or no readmission with epistaxis within 24 hours. Out of 71 patients 62 (87%) had good recovery, 6(8.5 %) were discharged on request, 2 (1.5%) left against medical advice and 1 (1.5%) was referred to higher centre. Out of 190 patients only 71 (37.5%) were admitted. The mean hospital stay was 6.6 days with standard deviation of 3.33 days. However, there were 4 cases that stayed up to 15 days.

Table 1. Showing age and sex distribution of cases (n = 190)

S. No.	Age group (years)	No. Of Patients	Male		Female	
			(No.)	(%)	(No.)	(%)
1.	0-10	43	31	16	12	6.5
2.	11-20	14	13	7	1	0.5
3.	21-30	25	23	12	2	1
4.	31-40	18	13	7	5	2.5
5.	41-50	42	36	19	6	3.5
6.	51-60	22	18	9	4	2
7.	61-70	21	15	8	6	3.5
8.	> 70	5	3	1.5	2	1
Total		190	152	79.5	38	20.5

Table 2. Distribution of cases as per Bleeding Sites

Procedure	*Vestibule	Antero inferior septum including Little's area	Antero superior septum	Lateral wall of nose	Generalised bleeding focii	Septum and lateral wall	Woodruff's area
Anterior rhinoscopy	2 (1%)	80 (42.5%)	----	----	----	----	----
Nasal endoscopy	----	----	34 (17.5%)	8 (4%)	48 (26%)	11(5%)	7 (3%)

* These were post rhinoplasty cases.

Table 3. Showing various modalities of treatment. (n=190)

Modalities of treatment	No. of cases	(%)
Observation + medication	35	18.5
Cauterization*	54	28.5
Anterior nasal packing**	79	41.5
Posterior nasal packing	15	8
Ligation of bleeding vessels	2	1
Surgical excision of bleeding intranasal tumour	5	2.5
More than one procedure required***	28	15

Table 4. Showing success of treatment modalities (n=190)

Non Surgical modalities of treatment	Treatment modalities	No. of patients	No. Patients treated successfully	(%)
Surgical modalities of treatment	Observation + medication	35	19	54.5
	Cauterization	54	49	91
	Anterior nasal packing	79	72	91
	Posterior nasal packing	15	15	100
	Ligation of bleeding vessels	2	2	100
	Surgical excision of bleeding intranasal tumour	5	5	100
	Total	190	162	85

DISCUSSION

In this study, epistaxis was found to be more prevalent in the young males, with a male: female ratio of 4:1 which is in agreement with [Eziyi et al. \(2009\)](#) and is common after 40 years which is not fully contrary to findings of [Pallin et al. \(2005\)](#) but show a shift of second peak towards the lower age group. Young males are the most active in the population and so are more vulnerable to trauma especially from fights, road traffic accident with maxillofacial injuries also causing epistaxis ([Gilyoma et al., 2011](#)). [Eziyi et al. \(2009\)](#) reported a majority of male subjects (77.4%) and 22.6% in females with a male: female ratio of 3.4:1. The peak age incidence was in the age group 21 – 40. [Pallin et al. \(2005\)](#) found a bimodal age-related frequency with peaks among those younger than 10 years and aged 70-79 years. [Varshney and Saxena et al. \(2005\)](#) in India reported most of their patients to be older than 40 years which correlates with other reports which showed that epistaxis is a geriatric problem. The low age incidence in our study may be attributed to the fact that the majority of our patients had traumatic epistaxis and patients with traumatic epistaxis tended to be younger than those with atraumatic epistaxis.

[Gilyoma et al. \(2011\)](#) reported that males were affected more than females, with a male to female ratio of 2.7:1.

In this study the most common site of bleeding was antero inferior septum including Little's area 42.5%, Generalised bleeding focii 26%, the anterosuperior septum (17.5%) and Woodruff's area 3.5%. [Kurien et al. \(1993\)](#) found antero inferior including Little's area most common about 46%, anterosuperior area 26% and 17.5% generalised bleeding focii. In this study on speculum examination we could locate sites in only 43.5% and nasal endoscopy was needed in rest to locate bleeding sites and we were able to locate bleeding sites in all the patients with the help of anterior rhinoscopy and nasal endoscopy. In this study the most common site of epistaxis was antero inferior septum including Little's area in 42.5% cases. The management of epistaxis is well summarized in an age-old dictum resuscitate the patient, establish the bleeding site, stop the bleeding and treat the cause of epistaxis. Dealing with a patient with active severe epistaxis can be bloody. Universal precautions were followed for all health care personnel involved in the care of these patients, The key to controlling most epistaxis is to find the site of the bleeding and cauterizing with silver nitrate or bipolar electro cautery, [Link et al. \(2006\)](#)

(found that ninety three percent (43/46) of patients followed-up for 2 months after therapy, and all of them had total or near-total resolution of their epistaxis. Five percent (2/43) of patients returned to the clinic after initial successful control for a second cauterization during the period of study. No significant complications of infection, perforation, long-term crusting, tattooing of mucocutaneous or allergic reactions, haemostasis, short hospital stay, low complication and cost effectiveness of the method of therapy. Treatment modalities can be divided into two groups, nonsurgical and surgical / interventional approaches. Non-surgical approach has been reported to stop the bleeding in more than 80-90% of cases (Rodney et al., 2009). In this study bleeding stopped in 83% of patients with non surgical methods. Anterior nasal packing was used in 41% of patients and was successful in 92.5% of them, while posterior nasal packing was used in 15 (8%) of patients and successful in 93% of the cases. Urvashi et al. (2004) reported successful use of anterior nasal packing in 93% case while posterior nasal pack was successful in 95.5% of cases. In our study observation along with use of nasal decongestants and antibiotics were administered in 35 (18.5%) patients, which showed a success rate of 54.5% and 16 (8.5%) patients among these required more than one modality of treatment, which is close to the figures got by (Gilyoma et al. 2011). Wurman et al. (1992) cautery of the bleeding site can be performed chemically, electrically or with laser. Cauterization with laser was not used in our study because of non availability. If the bleeding point was anterior and accessible, chemical cautery using silver nitrate was effective in controlling epistaxis. In this study 49 (26%) of patients were controlled with chemical and electro-cautery out of 54 patients who were cauterised and the success rate was 91%, similar figures had been reported by (Badran et al. 2005). Cauterization in the form of electrical cautery was carried out for a group of patients where the bleeding points could be identified during examination. Electrical cauterization was used successfully in 87% of cases. This figure was higher than that reported by Urvashi et al. (2004) in India. Nemer et al. (2008) (19) in Jordan reported a success rate of 74.0% which is lower than that of ours. We did not encounter any post cautery complications such as septal perforation or cartilage exposure. Since cauterization of the bleeding point entails a good success rate and no complications it should therefore be the preferred modality of treatment where ever the bleeding site could be visualized.

In our study bleeding was controlled by endoscopic ligation of sphenopalatine artery in 2 (1%) patients and achieved a success rate of 100%. In our study 28 (15%) patients required more than one procedure, which is in accordance with (Gilyoma et al., 2011). Rigid nasal endoscopy as part of the initial assessment in patients with epistaxis, with direct visualization and control of the bleeding point has been shown to be effective in the majority of patients, reducing the need for nasal packing (Daudia et al., 2008). The endoscopic management of epistaxis was also advised by (Bingham et al., 1991). In our study endoscopic ligation of sphenopalatine artery was required in 2 patients giving a success rate of 100 % and surgical resection was done in 5 patients of benign bleeding intranasal masses and also success rate was 100%. Shah et al. (2005) has reported endoscopic ligation of the sphenopalatine artery as

primary mode of management for severe posterior bleeding in patients with coagulopathies with similar success rate. Arterial ligation and embolization of bleeding vessels are the last resort for intractable epistaxis. Selection of the artery depends upon the area of the nasal cavity whether upper or lower half and on angiographic findings. Choice is usually between anterior ethmoidal artery or internal maxillary artery through an external approach. However, sphenopalatine artery, termination of internal maxillary artery may be ligated endoscopically. Embolization of feeding vessels may be an option in these cases, but carries high risk of complications. Nasal packing has the advantage of easy placement and removal Japhet et al. (2011). There was no need for an anaesthetist or theatre space for that treatment. It is also affordable to the patients. Complications of nasal packing include ECG changes, septal hematoma syncope, during insertion of nasal pack and sinusitis, pressure necrosis of the columella of nose with PNP, toxic shock syndrome later on Urvashi, et al. (2004).

Most of our patients did not suffered this due to adequate precautions. Only one patient in our study developed toxic shock syndrome. Japhet et al. (2011) recommend use of prophylactic systemic antibiotics and nasal packing with antibiotic soaked gauze to minimize this complication. The risks of surgical treatment include the risk of anaesthesia, blindness, oro-antral fistula, ophthalmoplegia, cosmetic deformity, infra orbital nerve dysfunction, these complications were not observed in our study. In our study we encountered 13 complications in 6 patients with a complication rate of 3.8% of these recurrent epistaxis and hypovolemic shock was 31% and 15.5%, which is in accordance of (Gilyoma et al., 2011). The use of antimicrobial prophylaxis in the presence of nasal packing for the treatment epistaxis remains controversial (Daudia et al., 2008). Most of literatures recommend that patients with high risk nasal packing should be started on prophylactic antibiotics, due to an increased risk for sinusitis and toxic shock syndrome. Blood soaked pack and raw mucosal surface are good media for bacterial multiplication resulting in infection including sinusitis and sometimes toxic shock syndromes (Gupta 1999).

The mean length of hospital stay in our stay was 6.6 days with a standard deviation of 3.33 which is higher than that reported by (Eziyi et al., 2009). Patients who underwent local cauterization were found to have significantly shorter hospital stay compared to those with anterior nasal packing. Those requiring posterior nasal packing remained in hospital for an average of 11.06 days. Availability of nasal endoscopes which offers both proper visualization and direct facility for endoscopic cauterization to the area that is not easily accessible may have been able to further reduce the hospital stay and the discomfort of postnasal packing. We concluded from our study that epistaxis being the commonest Otorhinolaryngologic emergency, affects all age groups and both sexes, with males more than females. Thus, reducing the incidence of trauma from RTA's reduce the incidence of emergency epistaxis in our centre. Non-surgical treatment is still useful to arrest nasal bleeding, safe and cost effective. Surgical intervention should be the last resort of treatment.

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