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Management of Epistaxis in A Rural Based Tertiary Care Hospital: Our Experience

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Abstract
Introduction*: Epistaxis is one of the most common emergency situation in ENT.A prompt intervention along with detection of the site of offending vessel is the key in its management.The study is about different types of epistaxis we encounter and how we managed it.*
Materials & Methods*: This prospective study was carried out among the patients presented with epistaxis at Burdwan Medical College & Hospital, from June 2015- July 2016. The patients who attended the ENT Out Patient Department(OPD), the ENT Emergency and the referred cases from other department, were included in this study.*
Results*: During the period of study, a total 110 patients were studied and results were evaluated.*
Conclusion*:We found two age groups,age less than 10 and more than 60 are the predominant to be affected.*
Abbreviations Used: *SPA-Sphenopalatine artery, ANS-Anterior nasal space, PNS-Posterior nasal space, TCA-Trichloroacetic acid*

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I. Introduction

Epistaxis is defined as bleeding from inside the nose or nasal cavity. It is most common emergency and accounts for ~1 in 200 emergency room consultation[1]. It is estimated to occur in 60% persons worldwide during their lifetime and approximately 6% of those with nose bleed seek medical attention[2-5]. It not only compromises the patient's haemodynamic status but also causes a great anxiety to the patient and his family[6]. Males are predominantly affected but after 50 yrs the incidence for both sexes are same[3,5,7].
Epistaxis can be classified as anterior and posterior epistaxis based on the site of origin of bleeding[8]. Anterior epistaxis is far more common than the posterior one, accounting for more than 80% of all epistaxis cases[5,9,10]. Anterior epistaxis occur more frequently in children and young adults. Its origin can either be arterial [Kiesselbach plexus] or venous [Retrocollumelar vein]. As in this cases the bleeding sites are accessible, they are often easy to manage. On the contrary, posterior epistaxis is more frequent in elderly and arises from the area supplied by the Sphenopalatineartery[SPA]. Usually in this cases there is profuse bleeding with diffuse mucosal oozing, posing a significant problem in addressing any particular bleeding point. Anterior epistaxis is usually managed by simple nose pinching, cauterization or ANS packing. Management of posterior epistaxis demands endoscopic intervention or PNS pack.

Epistaxis may be due to local or systemic causes. Local causes include inflammatory, infective, traumatic, anatomical(spur, DNS), climatic changes, neoplasms and foreign bodies. Similarly, systemic causes are coagulopathy, cardiovascular disease e.g hypertension, liver disease, renal disease and anticoagulant drugs. In majority of the patients the exact cause of bleeding is not well identified and they are lebelled as 'Idiopathic'[1,5]. Nose blowing, excessive coughing in Chronic Obstructive Pulmonary Disease(COPD), straining in constipation and Benign Prostatic Hyperplasia(BPH) and lifting heavy weights are the aggravating factors for the epistaxis. Treatment of epistaxis requires a systematic and methodical approach and options vary according to the cause, location and severity of the haemorrhage[5,9,10,11]. Both conservative and surgical methods are in practice for management of epstaxis[3,9]The aim of this study is to identify the etiological factors responsible for epistaxis and to determine the optimum management protocol for the same.

II. Materials And Methods

A prospective study was carried out among the patients presented with epistaxis at Burdwan Medical College & Hospital, from June 2015- July 2016. The patients who attended the ENT Out Patient Department(OPD), the ENT Emergency and the referred cases from other department, were included in this study.Initially the haemodynamic status and severity of bleeding is assessd. Stable patients with mild blood loss and absent active bleeding were evaluated promptly with detailed history, local and systemic examination. Unstable patients with severe degree of epistaxis were evaluated later on after controlling of bleeding. All the

patients underwent thorough detailed history and blood profile. Routine blood investigations e.gHb%, TC,DC,ESR, Platelet count, Blood Sugar(R), Ur,Cr were done in every cases. Coagulation profile was assessed by PT-INR, APTT, BT, CT. Blood for Dengue IgM&IgG were also done if there was any history of fever. CT scan was done in suspected cases to rule out sinonasal and nasopharyngeal malignancy. Blood grouping and crossmatching were done for the patients who needed blood transfusion. Apart from the above investigations Chest X-Ray, ECG and serological profile were done in patients who underwent GeneralAnaesthesia.

At first patients were assessed by means of anterior rhinoscopy . If no bleeding spot was found then they were examined endoscopically. Before endoscopic evaluation of the nasal cavities the nasal cavities were prepared optimally by the 4% lignocaine and 1:1000 adrenaline soaked cotton patties. Patients were subjected to surgical and non surgical treatment. Non surgical treatment includes application of topical vasoconstrictors e.gXylometazoline nasal drops, oral and IV antifibrinolyticse.gTranexamic Acid, Chemical and Electrical cauterization, Anterior and posterior nasal packing. Surgical methods include the Endoscopic SPA cauterization and Resection of tumours. Failure of conservative treatment to control bleeding is the indication for surgical intervention. Accessible bleeding spots on anterior rhinoscopy were cauterized using 20% Trichloroaceticacid(TCA) or by bipolar cauterization. Posterior one were managed with bipolar cauterization under endoscopic guidance. If there was diffuse mucosal bleeding and any particular bleeding spot was not identified the ANS pack was given. Posterior nasal packing was done, when ANS pack was failed to control bleeding. Patients with bleeding diathesis got absorbable gelatin sponge packing along with holding up the offending anticoagulant medication. Platelet transfusion was not required for any patient. In intractable epistaxis the surgical treatment is the last resort.

Medical records of these patients were collected and evaluated for demographics, cause of epistaxis, anatomical location of bleeding site and the treatment offered.

III. Results

During the period of study, a total 110 patients were studied. Among those 74(67.27%) presented through emergency, 32(29.09%) in OPD and 4(3.64%) were received from other department. The age of the patients varied from 4 yrs to 74 yrs. In our study we found bimodal rise in the incidence of epistaxis, one below 10 yrs(32;29.09%) and another being above 60 yrs(28;25.45%). Male and female ratio in our study was found to be 2.23(76:34). Anterior epistaxis was encountered in 68 cases(61.82%) and posterior epistaxis in 42 cases(38.18%)The cause of epistaxis couldn't be ascertained in 32 patients(29.09%); Idiopathic epistaxis. The second most common cause was trauma (27,24.55%) followed by hypertension (21;19.09%), rhinosinusitis (14,12.73%) and coagulopathy (10;9.09%).

Table1:Age wise distribution according to etiology

Cause	age	No of patients
idiopathic	<10	11
	11-20	2
	21-30	3
	31-40	2
	41-50	3
	51-60	4
	>60	7
traumatic	<10	12
	11-20	8
	21-30	3
	31-40	2
	41-50	1
	51-60	1
Hypertension	41-50	2
	51-60	3
	>60	16
Rhinosinusitis	<10	7
	21-30	2
	41-50	2
	51-60	3
Coagulopathy	<10	2
	51-60	3
	>60	5
Intranasal Tumour	11-20	2
	31-40	2
	51-60	2

Table 2: Age wise distribution of incidence of epistaxis

Sl no.	Age	No. of patients	Percentage
1	<10	32	29.09
2	11-20	12	10.92
3	21-30	8	7.27
4	31-40	6	5.45
5	41-50	8	7.27
6	51-60	16	14.55
7	>60	28	25.45
Total		110	100

Table 3: Cause wise distribution of incidence of epistaxis

Sl no.	Cause of epistaxis	No. of patients	Percentage
1	Idiopathic	32	29.09
2	Trauma	27	24.55
3	Hypertension	21	19.09
4	Rhinosinusitis	14	12.73
5	Coagulopathy	10	9.09
6	Tumour	6	5.45
Total		110	100

Table 4: Treatment wise distribution of cases of epistaxis

Sl no.	Type of treatment	No. of patients	Percentage
1	**Nonsurgical**	98	89.09
	a>ANS packing	56	50.92
	b>PNS packing	9	8.18
	c> Observation with medication	6	5.45
	d> Chemical cauterisation	9	8.18
	e>Electrocauterisation	18	16.36
2	**Surgical**	10	9.09
	a>SPA cauterisation	6	5.45
	b>Tumour resection	4	3.64
3	**Referral**	2	1.82
Total		110	100

Non surgical or conservative methods were successful to manage epistaxis in most of the cases (98;89.09%). Among these, ANS packing using merocel or antibiotic ointment impregnated ribbon gauze was most commonly done(56;50.92%). 9 patients (8.18%) required PNS packing and 6 patients(5.45%) were treated by only observation with medication. Chemical cauterization using 20% TCA was done in 9 cases(8.18%) and electrocauterisation using bipolar diathermy was carried out in 18 patients(16.36%). 10 patients needed surgical intervention. Endoscopic SPA cauterization using bipolar diathermy was done in 6 cases(5.45%). Out of 6 intranasal tumour 4(3.64%) were resected by Endoscopic sinus surgery and rest of the 2(1.82%) cases were referred to higher centres as there was intracranial involvement by the tumour. 14 patients(12.73%) needed blood transfusion.

Out of 56 patients, 40 patients(71.45%) received ANS pack by means of merocel and rest of the 16 patients(28.57%) received antibiotic soaked ribbon gauze packing. Merocel kept inside the nose for at least 5 days and it was well tolerated by the patients. Gauze pack was removed after 48 hrs in our indoor. PNS pack was given using gauze and we always removed the PNS pack at operation theatre to avoid torrential bleeding which is often encountered. Patients also received IV systemic antibiotics, IV antifibrinolytics(e.gTranexamic acid), oral antihistaminics, IM analgesics. Apart from these, stool softener(liquid paraffin syrup) and cough suppressant(Dextromethorphan syrup) were given in cases with constipation and COPD respectively. Patients with merocel pack also received topical antibiotic drops over the pack to reduce the chance of infection. Antibiotics were also prescribed to the patients who underwent chemical and electrical cauterization. All patients with nasal packs received oral alprazolam to alleviate anxiety and pain. A diagnostic nasal endoscopy was done in every case before discharge. During discharge, patients were advised not to blow their nose, to avoid nasal picking and to avoid strenuous activities e.g straining during defecation or micturation. All patients were discharged with oral antibiotics, antihistaminics, antifibrinolytics, sedatives and topical vasoconstrictors. All patients were followed up after 1 week.

The average duration of hospital stay for epistaxis was found to be 5.2 days(range 1 to 18 days). The patients who received cauterization as a treatment showed a mean hospital stay of 2.1 days, whereas those with ANS pack have a mean of 5.3 days. The patients with PNS pack showed even higher hospital stay(7.6 days).

IV. Discussion

In our study epistaxis was found to be prevalent in two age groups i.e below 10 yrs(32;29.09%) and above 60 yrs (28;25.45%). This finding is consistent with Pallin et al.[1] but in contrary to the findings by Eziyi et al.[12] and Gilyoma et al[6] who find epistaxis more prevalent in younger age group only. ParajuliR[13] and Varshney et al[14] found isolated increased incidence of epistaxis in older age group. In the present study high incidence of epistaxis among younger age group is attributed to the habit of nose picking, involvement in interpersonal violence, sports injuries and road traffic accidents. Nasal allergy, rhinosinusitis, temperature changes and dry heat produces hyperaemic nasal mucosa, which bleeds easily on blowing nose; picking nose or with trivial trauma[15]. Similarly the elderly patients usually have other comorbidities e.g diabetes and hypertension, which are responsible for sclerosis of arterial wall and making them fragile. These fragile vessels rupture easily with increased intravascular pressure due to straining during micturation and defecation at BPH and Constipation respectively; excessive coughing in COPD; lifting heavy objects[13].

In the present study, males were found to be 2.23 times more affected than the females. The male predominance was also found in other studies[12,16,17,18]. It is mainly due to high risk taking behavior and road traffic accidents. In most of our patients(32;29.09%) the cause of bleeding was not found so they were stamped as idiopathic. This finding goes in favor to the finding by Christensen et al.[19]. Trauma varied from minor digital trauma to maxillofacial injuries accounts for second most common(27;24.55%) cause. This is in discordance to the finding by ParajuliR[13] and Magbor et al.[16] who found hypertension as the second most common cause for epistaxis.Hypertension was found to be the cause in 21cases(19.09%). Now it is believed hypertension is not the cause of bleeding but it prolongs bleeding. Hypertensive patients develop arteriosclerosis & stiff, fragile vessels which ruptures easily & there is minimal vessel wall contraction due to lack of muscle coat. Though the causative factor for such rupture is not well identified[14]. These patients had uncontrolled hypertension probably either due to self omission of antihypertensive medications or due to inadequate drug therapy. Patients had also the history of infrequent blood pressure check ups. These patients need regular monitoring of blood pressure along with control over it with adequate antihypertensive medication.

Other causes of epistaxis were Rhinosinusitis(14;12.73%), Coagulopathy(10;9.09%), Tumour (6;5.45%). In rhinosinusitis the mucosa is inflammed with dialated mucosal vessels which often ruptures due to forceful nasal blowing or trivial digital injury.

Out of 10 patients in coagulopathy group 8 patients were elderly and was on warfarin, aspirin, clopidogrel therapy and the other 2 patients were children with ITP. The elderly patients with anticoagulant therapy showed a raised INR over theraputicrange(7 out of 8;87.5%). So, a meticulous monitoring of INR is essential for every case[21]. Walker et al proposed a protocol for managing anticoagulation related epistaxis[22].But in our experiecnce , in cases of active bleeding placement of Merocel or 'Abgel', absorbable gelatin into the nasal cavity was successful to stop the bleeding. Patients with absent active bleeding were observed ontopical(Xylometazoline)medication and oral medicationalong with holding the offending drug(e.g Warfarin, Clopidogrel, Aspirin). None of the patient required platelet transfusion.*

We got 6 bleeding masses as the cause of epistaxis. 4 patients were operated successfully at our institution and the other 2 were referred as they had intracranial extension.**

Epistaxis is one of the most commonly faced emergency to an ENT surgeon and it also poses a significant challenge in management. Single or multiple interventions may be required for control of bleeding, ranging from simple nose pinching tightly to endoscopic cauterisation of Sphenopalatineartery(SPA). The management of epistaxis is summarized as 1) Resuscitate the patient, 2) Establish the bleeding site, 3) Stop the bleeding & 4) Treat the cause of epistaxis[23]. Dealing with severe degrees of epistaxis may be bloody. Broadly the management protocol can be divided into two major categories i.e 1) Non-surgical/ Conservative management and 2) Surgical managaement.

In the present study majority of the patients (98;89.09%) were successfully managed by conservative methods. This goes with the findings of Parajuli R[13]who even found a greater success rate than ours. Patients with active bleeding were advised to pinch the nose tightly, then a careful and thorough anterior rhinoscopic examination was done and the visisble bleeding sopts were cauterised using 20% Trichloroacetic acid(TCA). If not controlled by the TCA, then bipolar suction cautery was used. We didn't use any monopolar cautery as it bears the probability of Optic and Occulomotor nerve damage[24,25]. For minor anterior bleed electrocautery and chemical cautery were done under local anaesthesia withoutendoscopic guidance. But, when certain bleeding spot was not found then the exploration of nasal cavity was carried out using 0^0 rigid nasoendoscope under local anaesthesia. Nose was prepared with 4% Lignocaine, 1:1000 Adrenaline and Salinesolution(1:1:2) prior to endoscopy. Endoscopic exploration and cauterisation under local anaesthesia is a very cheap, simple and quick way. Ahmed et al[26] found 89% success rate with endoscopic electrocutery.

Patients with diffuse mucosal oozing and with no definite site of bleeding were managed by ANS packing. A variety of materials ranging from ribbongauze, merocel to rapid rhino are available. But in our study we used merocel in majority (40;71.43%) of the cases. Rest of the cases were dealt with antibiotic soaked ribbon

gauze(16;28.57%). We observed better tolerance of patients to merocel than gauze packing, though the gauze packing was more efficient to control bleeding. This goes in discordance with the study done by Cobridge et al.[27] who doesn't find any difference between success rates of merocel and conventional gauze packing.
If bleeding, didnt get controlled with ANS packing then PNS packing was done under General anaethesia. We used gauze or foley's catheter for packing. Commercially available triluminalballoncatheter(Invotec) and Epistat nasal catheter are the other options, though they were not used due to cost and unavailability. After PNS packing , ANS packing was done.

Among conservative methods ANS pack was most commonly used(56;50.92%), followed by cauterisation (27;24.55%) and PNS packing (9;8.18%). Merocel was kept in situ for at least 3 days whereas the ANS and PNS pack was removed after 2 days in indoor and in OT respectively. Only 2 patients had recurrent epistaxis after PNS pack removal. So, PNS pack was successful in 7 out of 9 patients(77.78%). This finding is in contrary to the finding by Gilyoma et al.[6] where they found PNS pack to be successful in 91.7% cases. Every patient with nasal pack got prophylactic systemic antibiotics to avoid complications. Blood soaked packs and raw mucosal surfaces both acts as good media for growth of microbials resulting in sinusitis and toxic shock syndrome[28].

For the bleeding related to coagulopathy(10;9.09%) nose was either packed with merocel or with Abgel along with holding the offending medication. None needed platelet transfusion.
In the present study, surgical intervention was needed in 9.09%, which is higher than Gilyoma et al.[6] and Parajuli R[13]. Surgical treatment options include embolisation of offending vessel and arterial ligation. Embolisation is done using steel wires, polyvinyl alcohol, gel foam. It has been found to be successful in cessation of bleeding in 87% o fcases[29]. There are certain complications e.g. CVA, blindness, oroantral fistula, ophthalmoplegia, facial palsy, soft tissue necrosis[30]. None of our patient underwent this procedure.
Ligation or cauterisation of various vessels traversing the nasal cavity may be done endoscopically or via open approach. Anterior ethmoidal arterycan be identified at skull base above the bulla running from the orbit to the ethmoid skull base. After identification it may be cuterised by using bipolar cautery. Care must be exercised so that the artery doesn't get retracted to orbit during cuterisation, as it may auseretrobulbarhaematoma and eventual blindness. Combined approach FESS (CAFESS) is used to ligate internal maxillary artery at infratemporal fossa. This procedure found to be effective in 87% cases[31]. But it is rately done now a days to avoid complications e.g sinusitis, facial pain, oroantral fistula, paraesthesia[32]. Ligation of external carotid were done previously and now has been abandoned due to frequent treatment failure. As the collateral develop and there is no cessation of bleeding.

At present the method of choice is endoscopic ligation of SPA. It is more ideal as it is the terminal branch. 6 patients underwent SPA cauterisation in the present study and we found a 100% success rate, with no rebleed after 2 wk of followup. The overall success rate of more than 85%[33] has been reported in literature. Minor rebleeding requiring nasal packing occurs in ~15-20% cases[33]. Complications of SPA cauterisation may be nasal crusting(34%), palatal numbness(12%), and acute sinusitis(3%)[34]. Nasal saline spray irrigation was advised during discharge. Mean hospital stay was 2.8 days. In the present study, 14 patients(12.73%) required blood transfusion. Rate of blood transfusion ranges from 6.92-15.1% in literature[14,18]. So our finding also goes with it. The mean hospital stay was 5.2 days which is less than the finding of Gilyoma et al[6]. The electrocauterised patients had a short hospital stay(2.1 days) in comparison to them who received ANS pack(5.3 days). Patients with PNS pack had a significant hospital stay (7.6 days) owing to its poor tolerance. Patients with SPA cauterisation had a mean hospital stay of 2.8 days. So the SPA cauterisation offers a better relief from bleeding as well as short hospital stay in comparison to ANS and PNS packing.

Now, nwerteratmentmodalitied has been introduced e.g fibrin glue and laser cauterisation. Randomized controlled trials had found that the complications were less than the electrocautery[35]. Laser is used to control bleeding associated with vascular anomalies e.gHerditaryhaemorrhagictelangiectesia[36].

V. Conclusion

Epistaxis is one of the most frequently encountered emergency by an ENT durgeon. People of all age may be affected. Most of the time the etiology remains unknown and labeled as idiopathic. Trauma, hypertension, rhinosinusitis, coagulopathy, tumour are the other causes in descending order. Most of the patients are well managed by conservative methods e.g nasal packing and local cauterisation. Conservative methods of teatment are safe and cheap as well easy. Whereas in intractable cases surgical intervention is warranted.

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