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ORIGINAL ARTICLE

Control of Anterior Epistaxis: A Comparative Analysis of the Decongestive Effect of Xylometazoline and Adrenaline in Idiopathic Epistaxis in Emergency Settings

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ABSTRACT

Objective: To compare the impact of decongestive effect of xylometazoline and adrenaline in controlling active idiopathic anterior epistaxis on adult patients prior to use silver nitrate for cauterization.

Study design: Prospective case study.

Methods: The study used a prospective review of 150 consecutive adult patients diagnosed as anterior epistaxis (from August 2010 to January 2011). The study group was analyzed in three groups based on method of intervention used for management of anterior epistaxis. The conventional method of pinching nose and use of xylometazoline (0.5%) or adrenaline (1:10,000) soaked cotton packs for control of active arterial spurt followed in each case with silver nitrate cauterization.

Results: A total of 150 patients reviewed who were medically fit and subjected to study design in three groups. Fifty adult patients in each group with similar presentation. In first group, 32 patients out of 50 (64%) had successful control of bleeding with silver nitrate cauterization only after pinching nose (for 10 minutes). In second group, it was seen that 43 patients out of 50 (86%) in one group had successful control of bleeding following use of 0.5% xylometazoline-soaked cotton packs (for 10 minutes). prior to silver nitrate cauterization. In another group, 45 patients out of 50 (90%) had successful control of bleeding following use of 1:10,000 adrenaline-soaked cotton packs (for 10 minutes) prior to silver nitrate cauterization.

Conclusions:

1. Almost all patients with idiopathic anterior epistaxis can be managed more effectively and successfully by the use of vasoconstrictive agents followed by silver nitrate cauterization and risks of anterior nasal packing can be avoided.
2. The success rate of silver nitrate cauterization can be increased significantly with use of vasoconstrictive agents (xylometazoline and adrenaline) for control of actively bleeding arterial spurts prior to cauterization.
3. With the use of adrenaline not suitable in high-risk group patients, like coronary artery disease, cerebrovascular diseases, myocarditis, drugs like beta blockers, tricyclic antidepressants; xylometazoline can safely replace adrenaline in these cases.

Keywords: Anterior epistaxis, Arterial spurt, Adrenaline, Xylometazoline, Silver nitrate, Adrenaline contraindications.

INTRODUCTION

Epistaxis is the most common ENT emergency, affecting about 60% of the population. It is beyond doubt that the problem of epistaxis constitutes a significant amount to the workload of otorhinolaryngology department. The condition can occur at any age but is mainly seen in adults. Between 7 and 14% of adults have epistaxis at some time or other, but only 6% seek medical attention.[1-3] Majority of cases of epistaxis stop spontaneously and in the great majority of cases is easily controlled. It may, however, be extremely persistent and, although seldom endangering life, may cause much anxiety to both patient and physician.

Over the years a number of methods for controlling a nose bleed have been advocated, ranging from dripping blood into a basin while placing a cork in the mouth (Trotter's method), to inserting strips of smoked bacon into the nasal cavities and most accepted method is pinching the lower part of nose thus applying direct pressure to Little's area (most common site).[2,5] Most of the epistaxis issue is due to rupture of blood vessel on the nasal septum. The key to effective management of these patients ies in identification of the bleeding point and subsequent cauterization. Epistaxis has traditionally been divided into anterior and posterior, based on site of bleeding.[1] Unfortunately, there is no

universally accepted landmark for this division. Pearson attempted to standardize the term posterior epistaxis as a bleeding point which could not be located despite examination with headlight, vasoconstrictors and suction.[4] A review of literature standardizes the use of the most occurring terms: anterior and posterior epistaxis. Anterior epistaxis is bleeding from a source anterior to the plane of the piriform aperture, while posterior epistaxis being from vessel situated posterior to the piriform aperture. The management of epistaxis, by direct and indirect methods, much relies on the site of bleeding.[1,2,8] As the localization of site of posterior epistaxis is difficult in usual settings indirect method which does not require identification of bleeding point (i.e. nasal packing) is the treatment of choice. For anterior epistaxis straightforward identification of bleeding point is essential and direct treatments are logically, theoretically and practically superior. The success of direct treatment, which is silver nitrate cauterization depends on how dry the anterior bleeding focus was prior to cauterization.[1,4]

A review of literature indicates a surprising lack of any prospective study for control of anterior epistaxis and comparative analysis of success of use of vasoconstrictors in achieving dry focus of bleeding site for successful cauterization. This study was, therefore, undertaken to study the methods of controlling idiopathic anterior epistaxis and comparing the role of xylometazoline and adrenaline as vasoconstrictive agent in achieving successful control of arterial spurts prior to cauterization.

MATERIALS AND METHODS

A prospective study was conducted on 150 patients with anterior epistaxis (arterial spurts) who satisfied. Inclusion criteria and who attended the Department of ORL and Head and Neck Surgery of Government Medical College, Srinagar and Associated Hospitals over 6 months period from August 2010 to January 2011. The patients included in the study were all adults between age group 40 and 80 years (mean age group 61 years). We excluded from our study patients with history of trauma, recent sinusoidal surgery, any bleeding diathesis, or patients with earlier intervention on bleeding site at primary health center. All the patients included in study presented with spontaneous onset of epistaxis and bleeding arterial spurt were cleary identified on anterior rhinoscopy. Relevent patient details, comorbid conditions and medications were recorded on a study proforma.

During the period of study all the enrolled patients were seen by ENT trainees. Rigid nasal endoscope was not used for nasal examination as all the patients were diagnosed as anterior epistaxis with simple nasal examination method with Killian's anterior rhinoscope. After cleaning, the bleeding nasal cavity with suction apparatus, patients were made to relax on examination table and 10% xylocaine spray was used to anesthetize the nasal cavity before any further examination and intervention. A total of 150 patients were divided into three groups randomly and three different treatment modalities were used:

Group A: Fifty adult patients presenting with anterior epistaxis were enrolled in group A. Soft part of their noses was pinched by an assistant specially trained for the purpose. A trained assistant was needed as it is a known fact that common masses, including medicos, may lack the knowledge of applying pressure at an appropriate site.[7] The pressure was applied for 10 minutes. The nasal cavity was again examined and in patients where temporary hemostasis was achieved silver nitrate was used for cauterizing around and in the bleeding site. Patients were kept for 1 hour observation after cauterization and advised follow-up in OPD after 4 days and only antibiotic ointment was prescribed for 4 days. Rest of the patients who were actively bleeding even after 10 minutes of pinching nose or who rebled in 1 hour observation were taken as failure group A patients. Those who rebled at 4 days from the same site were also considered as failures.

Group B: Fifty adult patients diagnosed as anterior epistaxis with active aterial spurt were subjected to vasoconstrictive effect of xylometazoline before cauterization. Bleeding nasal cavity was packed with cotton packs soaked in xylometazoline 0.5% (xyloflo) for 30 minutes. After that nasal cavity was again examined and patients with sufficient hemostasis due to vasoconstriction were subjected to silver nitrate cauterization. Patients were kept for observation for 1 hour after cauterization and advised follow-up in OPD after 4 days and only antibiotic ointment was prescribed. Rest of the patients who were seen actively bleeding after removal of cotton packs after 30 minutes and patients who rebled in 1 hour observation after cauterization were taken as failure group B patients. Again those who rebled at 4 days from same site were considered as failures. Local antibiotic ointment was prescribed for 4 days.

Group C: Fifty adult patients diagnosed as anterior epistaxis with active arterial spurt were subjected to vasoconstrictive effect of adrenaline before cauterization. The bleeding nasal cavity was packed with cotton packs soaked in 1:10,000 adrenaline solution and kept for 30 minutes. After that cotton packs were removed and nasal cavity was examined again. Patients in whom bleeding was sufficiently controlled due to vasoconstrictive effect of adrenaline were subjected to silver nitrate cauterization.

Patients were observed for 1 hour after cauterization and were advised follow-up in OPD after 4 days. Meanwhile, only antibiotic ointment was prescribed. Those patients who were seen bleeding even after removal of cotton packs and those who rebled in 1 hour observation time and/or 4 days were taken as failure group C patients.

RESULTS AND ANALYSES

The study group of 150 patients who were analyzed in three random groups and different intervention methods were used in each group. In group A, 64% (32 out of 50) patients were found successfully treated in 4th follow-up day. In group B, 86% (43 out of 50) patients came out to be successfully treated in follow-up period. In group C, 90% (45 out of 50) patients were successfully managed. The rest of the patients who could not be treated successfully in respective groups (failure group patients), i.e. 18 out of 50 (36%) patients in group A, seven out of 50 patients (14%) in group B, five out of 50 patients (10%) in group C, were managed with conventional anterior nasal packing or light anterior nasal packing for 48 hours. Those who failed to follow ENT OPD at 4 days of follow-up were excluded from the study.

Analysis of statistical data in three groups clearly shows that management of anterior epistaxis using vasoconstrictors like xylometazoline and adrenaline prior to silver nitrate cauterization has signicantly better results than simple pinching of nostrils for hemostasis prior to cauterization. Comparative analysis of xylometazoline and adrenaline used for temporary hemostasis has not shown much difference. Use of adrenaline has better effect but due to risk associated with it, xylometazoline can be safely used in all subjects.

DISCUSSION

Epistaxis forms a major outpatient rush of the department of ENT in all parts of the world including our hospital where this study was conducted. At times epistaxis may manifest as a severe picture that requires hospital admission. The burden of hospital admissions due to epistaxis mainly posterior epistaxis has reduced manyfolds over few decades of time due to everchanging methods of management and use of endoscope in management of epistaxis.[6] It is common and effects all age groups with higher frequency in elderly males.[1-3] Traditionally, epistaxis has been classified as mild, moderate and severe on basis of severity and on basis of site of bleeding as anterior and posterior epistaxis. In our study group only patients that were diagnosed as idiopathic anterior epistaxis were considered. Most of the patients were elderly in age range 40 to 80 years (mean 61 years).

The aim of the study was to determine the definitive method of controlling idiopathic anterior epistaxis in adult patients. The study result clearly showed that almost 90% of patients of all grades of severity can be managed by the use of vasoconstrictor agent for temporary hemostasis and silver nitrate cauterization in first sitting. This reduces the hazards of anterior nasal packing and reduces the hospital admissions of epistaxis patients.

Another aspect of this prospective study systematically showed the beneficial effect of using vasoconstrictor agent in actively bleeding arterial spurts over conventional method of pinching nose. The comparative effect of xylometazoline and adrenaline as vasoconstrictive agent in controlling active arterial spurt prior to cauterization was studied. The study result analysis revealed that success rates with these two methods of intervention did not vary much. But with use of adrenaline not found suitable in high-risk patients, like patients with hypertension, coronary artery disease, cerebrovascular diseases, myocarditis, other vascular diseases and arrhythmogenic drugs, like anticonvulsants, etc. It is contraindicated in patients on nonselective beta blockers, tricyclic antidepressants. From this study, we concluded that the difference in the success rates of xylometazoline and adrenaline does not vary much statistically and thus xylometazoline can safely replace adrenaline in cases where adrenaline is contraindicated or in cases where there is a caution in its use.

Study Design

This is a prospective study to compare the success of achievement of hemostasis in idiopathic anterior epistaxis.

Setting

The study was conducted in SMHS Hospital, an Associated Hospital of Government Medical College, Srinagar, JK, India.

Hypothesis Testing

This study was designed to compare the results of various interventions used in controlling idiopathic anterior epistaxis.

Inclusion Criteria

1. Patients with anterior epistaxis where bleeder was identified with simple nasal examination and Killian's anterior rhinoscope.
2. No age bar was kept in the inclusion criteria.
3. Hypertensive patients controlled on treatment and having normal blood pressure at the time of presentation

were included. This was done as hypertension is common in the mean age group of 61 years and is even commoner in this part of world. Only those hypertensive patients were enrolled who had complete medical records and regular blood pressure monitoring.

Exclusion Criteria

1. Patients with comorbid conditions, like bleeding diathesis, collagen vascular diseases, diabetes, etc. which could be the cause of bleeding were excluded from the study.
2. Likewise traumatic epistaxis was not included in the study.
3. Hypertensive patients on erratic treatment and having raised blood pressure at the time of presentation were excluded.
4. Patients with posterior epistaxis or predominant posterior epistaxis were also excluded from the study.
5. Patients in whom bleeder cannot be identified using Killian's rhinoscope and/or simple nasal examination.
6. Patients in whom bleeder was identified only with nasal endoscope.
7. Incomplete follow-up.

Size of Sample

The study recruited a total of 150 patients. These patients were categorized into three groups each with 50 patients. Group A was managed with simple pinching of nose; group B with xylometazoline packing; group C with adrenaline packing, followed in each case by silver nitrate cauterization in and around the bleeder.

Outcome Measure

The major outcome measure was achievement of successful hemostasis immediately, during and at 1 hour postprocedure and at 4 days of follow-up.

The strengths in this study were that the sample size was large, hemostasis as an outcome measure was checked over a long follow-up period. Follow-up was complete and we had no dropouts. Also, the study did not deal with recall bias, ascertain bias and sampling bias. Random number tables were used to categorize the patients into various groups.

Statistical Inference

Group A included patients who were managed by pinching soft part of the nose followed by silver nitrate cauterization. Success rate achieved was 64%.

Group B included patients who were managed by xylometazoline-soaked cotton pack followed by silver nitrate cauterization. Success rate achieved was 86%.

Group C enrolled patients who were packed with adrenaline-soaked cotton pack followed by silver nitrate cauterization. Success rate achieved was 90%.

Group A	
Total patients enrolled	50
Successful hemostasis	32
Group B	
Total patients enrolled	50
Successful hemostasis	43
Group C	
Total patients enrolled	50
Successful hemostasis	45

Chi-Square Test

This test was applied:

1. With groups A and B
2. With groups A and C
3. With groups B and C taking group A as expected success rate
4. With groups B and C.

Chi-Square Test with Groups A and B

Group A (pinching followed by silver nitrate cauterization)	
Total patients enrolled	50
Successful hemostasis	32
Group B (xylomet-soaked cotton pack followed by silver nitrate cauterization)	
Total patients enrolled	50
Successful hemostasis	43

As is evident, the success rate in group A is 64% and in group B is 86%.

As group A comprises the most common intervention used worldwide, we kept it as the expected success rate. Thus,

Expected success rate, e = 64

Observed success rate, o = 86

$$\chi^2 = (o - e)^2/e$$
$$= (86 - 64)^2/64$$
$$= 22^2/64$$
$$= 7.562$$

Here no. of degrees of freedom, n = 1

Computing p from Chi distribution table: p = 0.01.

As $p < 0.05$, null hypothsesis is rejected. This means that xylometazoline has a significant effect on achievement of hemostasis.

Chi-Square Test with Groups A and C

Group A (pinching followed by silver nitrate cauterization)	
Total patients enrolled	50
Successful hemostasis	32
Group C (adrenaline-soaked cotton packs followed by silver nitrate cauterization)	
Total patients enrolled	50
Successful hemostasis	45

Again the success rate in group A is 64% *vs* 90% in group C.

Applying Chi-square test:

Here expected success rate, e = 64%

Observed success rate, o = 90%

Thus,

$$\chi^2 = (o - e)^2 / e$$
$$= (90 - 64)^2/64$$
$$= 676/64$$
$$= 10.562$$

Computing p-value from Chi-square distribution: p = 0.001 (dF = 1).

This means adrenaline has significantly affected the achievement of hemostasis.

Chi-Square Test with B and C considering Group A as expected

Group A (pinching followed by silver nitrate cauterization)	
Total patients enrolled	50
Successful hemostasis	32
Group B (xylometazoline-soaked cotton pack followed by silver nitrate cauterization)	
Total patients enrolled	50
Successful hemostasis	43
Group C (adrenaline-soaked cotton packs followed by silver nitrate cauterization)	
Total patients enrolled	50
Successful hemostasis	45

Considering the success rate achieved in group A as expected, e = 64

Observed value for group B, $O_1 = 86$

Observed value for group C, $O_2 = 90$

Applying Chi-Square Test

$$\chi^2 = (O_1 - e)^2/e + (O_2 - e)^2/e$$
$$= (86 - 64)^2/64 + (90 - 64)^2/64$$
$$= 7.562 + 10.562$$
$$= 28.124$$

Thus, from Chi-square distribution, p-value is 0.001.

Thus, both interventions significantly show deviations which cannot be attributed to chance only.

Chi-Square Test with Groups B and C

Group B (xylometazoline-soaked cotton pack followed by silver nitrate cauterization)	
Total patients enrolled	50
Successful hemostasis	43
Group C (adrenaline-soaked cotton packs followed by silver nitrate cauterization)	
Total patients enrolled	50
Successful hemostasis	45

To compare group B with group C, we consider group B as control (expected success rate). Group C will be observed rate.

Expected success rate, e = 86

Observed success rate, o = 90

$$\chi^2 = (o - e)^2/e$$
$$= (90 - 86)^2/64$$
$$= 16/64$$
$$= 0.25$$

From Chi-square distribution, p-value is found out to be 0.60.

As p-value is greater than 0.05, deviation between them is merely due to chance and that there is not much difference between these results.

CONCLUSION

	Between groups A and B	*Between groups A and C*	*Between groups A, B and C*	*Between groups B and C*
χ^2	7.562	10.562	28.124	0.25
p	0.01	0.001	0.001	0.60
Conclusion	Xylometazoline significantly alters the outcome	Adrenaline significantly alters the outcome	Xylometazoline and adrenaline significantly alters the outcome	Xylometazoline and adrenaline do not significantly alter the outcome with respect to each other

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