NORMAL SALINE SOAKED EXPANDABLE POLYVINYL ALCOHOL NASAL PACK VERSUS TRANEXAMIC ACID SOAKED EXPANDABLE POLYVINYL ALCOHOL NASAL PACK IN A PATIENT WITH EPISTAXIS: A COMPARATIVE STUDY

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ABSTRACT

Objectives:

The study aims to compare the time required to arrest bleeding in patient packed with expandable polyvinyl alcohol nasal pack with locally applied tranexamic acid or with normal saline.

Materials and methods:

A prospective comparative study was conducted at Kathmandu Medical College, ENT-HNS Department for a period of 12 months(January 2017-December 2017). Among 158 patients, 79 patients were included in each group in the study. The findings regarding the time taken to arrest the bleeding and evidence of re-bleeding seen after removal of pack in each group were noted and tabulated.

Results:

Average time required for arrest of bleeding was 3.86 minutes in tranexamic acid group and 4.35 minutes in normal saline group. 55% of the patients belong to blood group O. Total number of 121 patients had associated DNS in anterior rhinoscopy. Out of 24 patients experiencing re-bleeding, 15 were from the normal saline soaked group.

Conclusion:

Injectable tranexamic acid applied locally helps to reduce the bleeding time and prevents the evidence of re-bleeding in patients with epistaxis. Other study with larger sample size and multi-centered study is required to establish the result.

Keywords: Deviated Nasal Septum, Epistaxis, Expandable Polyvinyl Alcohol nasal pack, Nasal packing, Tranexamic acid.

INTRODUCTION

Epistaxis is a common problem, with many of us experiencing at least one episode in a life time. Anterior epistaxis is more likely in children and young adults(often men in the fifth decade of life with hypertension and arteriosclerosis).[1] Although epistaxis can occur secondary to surgery, trauma, hypertension, bleeding disorders, hereditary hemorrhagic telangiectasia, and antiplatelet and anticoagulation drug use, its etiology is unknown in 70% to 80% of cases.[2] Current treatment of epistaxis includes pinching of the nose, using vasoconstrictor agents, chemical or electrical cauterization, and nasal packing with ribbon gauze or expandable polyvinyl alcohol nasal pack. Packing is usually performed after application of an anesthetic agent such as lidocaine and a vasoconstrictor such as epinephrine, this leads to mucosal shrinkage and provides ease of insertion of nasal pack. One of the most routine management for epistaxis, anterior nasal packing, has some limitations including requirement of analgesics, time consuming and these warrant assessing a more simpler method. Epistaxis is usually self-limiting but can be life

threatening, especially in elderly patients or those with underlying conditions.

Variety of materials used to pack the nose has increased greatly, the type of pack preferred by

attending doctor is often determined by inherited practice. Beside other routinely applied methods like chemical cautery, anterior nasal packing, ligation of bleeding vessels, several other locally applied hemostatic agents like tranexamic acid and aminocaprionic acid have been applied topically.[3]

Tranexamic acid is a synthetic analog of the amino acid lysine. It serves as an antifibrinolytic by reversibly binding four to five lysine receptor sites on plasminogen or plasmin. This prevents plasmin from binding to and degrading fibrin and preserves the framework of fibrins matrix structure. Tranexamic acid has around eight times antifibrinolytic activity than aminocaproic acid.[4]

MATERIALS AND METHODS

It was a prospective, comparative interventional study conducted at Department of Otorhinolaryngology, Kathmandu Medical College, Kathmandu, Nepal for 12 months from January 2017 to December 2017 after obtaining ethical clearance from Institutional Review Committee. Those patients with anterior epistaxis presenting to Emergency Department and ENT OPD and patients with idiopathic etiology and recurrent anterior epistaxis even with recurrent previous intervention enrolled into study. Patients with the history of anti-platelets /anti-coagulant drug use or with history of bleeding disorder, epistaxis following major trauma,following any nasal surgeries, patients with underlying neoplasm (benign or malignant), posterior epistaxis, patient who declined to take part in the study and, uncooperative patients were excluded from the study.Treatment of choice between two methods was selected randomly by using lottery method by the principal investigator.

Once the patient with epistaxis was received, airway, breathing and circulation was assessed and maintained. Short and relevant history was taken from patient or patient party. Pinching of the nose after introduction of 0.05% oxymetazoline soaked cotton pledget and ice compression was done for 10 minutes in every patient. Anterior rhinoscopy and examination of posterior pharyngeal wall of oropharynx was done. Expandable polyvinyl alcohol nasal pack was inserted into bleeding nasal cavity and soaked with normal saline(3ml) or tranexamic acid(500mg) if not controlled by above measures. Detailed history about bleeding like onset, duration, history of trauma, previous nasal surgery, long term use of antiplatelet and anticoagulant drugs, similar episodes in past, nasal obstruction, was taken once the bleeding was controlled. The time needed to arrest initial bleeding after insertion of pack, checked by evidence of bleeding in the posterior pharyngeal wall (PPW) graded by[2]

No bleeding = 0
Staining of dressing =1
Oozing = 2
Moderate bleeding = 3
No control = 4

Time needed for arrest of bleeding was checked using mobile timer. Intravenous tranexamic acid was not given to patient after his/her arrival in and throughout the period of study.Bolster was applied and patient was transferred to ENT ward for observation and i. v. antibiotics. Pack was removed after 72 hours and evidence of re-bleeding was checked.

Evidence of re-bleeding after removal of pack was also checked using similar grading scale as for bleeding after keeping pack. The finding regarding the time taken to arrest the bleeding by both method was tabulated and similarly evidence of re-bleeding seen after removal of pack in both methods were noted and tabulated.

RESULTS

The total 158 patients who presented to KMC Emergency department during the period of study were divided into 2 groups, containing 79 patients in each group, with random age and sex distribution. The youngest patient reported was of 15 years of age and the oldest patient was 87years of age. Of those included 105(66%) were male, and 90(49%) were of age 50 years or more and maximum number of patients were encountered of 7th decade of life followed by 5th to 6th (Table 1).

Table 1: Age distribution of patients

Age in years	Number of patients	Percentage(%)
11-20	5	3
21-30	14	9
31-40	22	14
41-50	29	18
51-60	29	18
61-70	33	21
71-80	17	11
81-90	9	6

Following anterior nasal packing with expandable polyvinyl alcohol nasal pack with tranexamic acid or with normal saline the bleeding stopped earliest by 1 minutes and to the maximum by 15 minutes. However, the average time required for arrest of bleeding in tranexamic acid soaked group was 3.86 minutes and that in the normal saline soaked group was 4.35 minutes. Out of all patients who underwent anterior nasal packing with expandable polyvinyl alcohol nasal pack, irrespective of the group, 19(12%) patients had encountered epistaxis in-spite of having the pack in-situ. Of them 15 patients encountered epistaxis within 24 hours of anterior nasal packing, three within 48 hours and one after 48 hours and before removal of pack. Out of those 19 patients, 11(58%) patients belonged to normal saline group. Though statistically not significant ($p>0.05$), this result shows that the patient packed with normal saline soaked expandable polyvinyl alcohol nasal pack has 1.6 times (Relative Risk) higher chance of bleeding with pack in-situ than those packed with tranexamic acid.

Table 2: Average time required for arrest of bleeding after packing

Group	Average time required (in minutes)	Range (in minutes)
Tranexamic acid group	3.86	1-15
Normal saline group	4.35	1-15

Out of remaining patients who didn't show any evidence of re-bleeding till 72 hours of anterior nasal packing, 19(12%) patients required repacking after removal of pack and Five (3%) patients required chemical cautery with 10% Silver Nitrate solution. Out of total 24 patients who experienced re-bleeding 15(62.5%) were from normal saline soaked group. Among those 15, 12 patients required repacking.Although this result was also statistically not significant($p>0.05$), it also shows that normal saline soaked group has 1.6 times (Relative Risk) higher risk of re-bleeding after removal of pack.

DISCUSSION

In the present study, 158 patients who visited to Emergency Department with anterior nasal bleeding were evaluated. These patients were divided into two groups each containing 79 patients and each group received similar treatment except one group was packed with normal saline soaked expandable polyvinyl alcohol nasal pack and other group with tranexamic acid soaked ones.

The age of the patients in the study ranged from 15 years to 87 years of age with age more than 50 being 90 in number and that less than or equal to 50 being 68. This is similar to study conducted by Zahed et al.[5] The commonly affected age groups in the study was 50 or more which included 90(56.9%) patients and 68(43.1%) patients were of less than 50 years of age. To be precise, maximum number of patients were in the 7th decade (21%) of life followed by 5th and 6thdecade(18% in each). This was similar to the study carried out by Bista et al.[1] in which the age of utmost frequency is at 4th to 6th decade of life followed by 6th to 8th decade.[1] Logan et al. and Razdan et al. also found the similar results in their study.[6,7] The probable explanation of disease being most common in elderly population is that the vessels are more exposed to dry air due to atrophied mucosa of nasal cavity and roomy nasal cavities.[8]

The study showed male predominance. Similar finding were noted in the study conducted by Shrestha et al. and Hassain et al.[9,10] In this study male to female ratio was 1.9:1. The factor contributing to male predominance may be due to more exposure of male to dry outer environment/ weather as most of the female are involved in household job. Similar results were seen in the study of Bista et al. which showed male to female ratio of 1.5:1.[1]

The average time required for arrest of bleeding in tranexamic acid soaked group was 3.86 minutes

and that in the normal saline soaked group was 4.35 minutes. Out of all patients who underwent anterior nasal packing with expandable polyvinyl alcohol nasal pack, irrespective of the group, 19(12%) patients had encountered epistaxis in-spite of having the pack in-situ. Of them 15 patients encountered epistaxis within 24 hours of anterior nasal packing, three within 48 hours and one after 48 hours and before removal of pack. Out of those 19 patients, 11(58%) patients belonged to normal saline group. Similar results were seen in a study conducted by Birmingham et al. where 216 patients with idiopathic anterior epistaxis were treated, where topically applied injectable tranexamic acid was associated with higher proportion of patients achieving cessation of bleeding within 10 minutes, compared to topical epinephrine and lidocaine followed by anterior nasal packing (ANP).[11] Similar results were seen in study conducted by Gottlieb et al. and Santander et al.[12,13]

Among all the patients in this study, 24(15%) patients experienced re-bleeding after removal of pack after 72 hours of anterior nasal packing of whom 15(62.5%) were from normal saline group and rest were from tranexamic acid group. Among these 15 patients, 12 patients required repacking, which showed that expandable polyvinyl alcohol nasal pack with normal saline had 1.6 times more risk of re-bleeding than the tranexamic acid group. Similar results were seen in a study done by Birmingham et al., where secondary outcomes also demonstrated significantly fewer re-bleeding events within 24 hours and had shorter hospital stay after treatment with injectable tranexamic acid topically.[11]

CONCLUSION

This study shows that using injectable form of tranexamic acid topically along with expandable polyvinyl alcohol nasal pack could provide a better treatment for anterior epistaxis compared with other group without tranexamic acid. Shorter time to stop bleeding, fewer re-bleeding cases, comparatively very painless for patients and convenient for health care providers are advantage of using this method. This will be a very promising method to control epistaxis and will add another dimension in the management of nasal bleeding cases.

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