

# Efficacy of chemical and electrical cautery (Comparison) in management of Anterior Epistaxis

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## Abstract

**Objective:** To compare the efficacy of chemical versus electrical cautery in the management of patients presenting with anterior epistaxis in terms of frequency of bleeding.

### Materials and Methods:

Study Design = Randomized Control Trial (RCT)

Study Setting = ENT Department Benazir Bhutto Hospital, Rawalpindi

Duration = 6 months

Sampling Technique = Consecutive (Non Probability)

A Randomized Control Trial (RCT) of six months was done after the approval of the Ethical Committee. A total of 90 cases of anterior epistaxis were randomly divided into two groups: A (electrical cautery) and B (chemical cautery) using a random number trial with 45 in each group respectively. Informed consent was taken from all patients. Patients were explained about the procedure and its risk-benefit ratio. A detailed history was taken about epistaxis from patients presenting in an emergency. The site of bleeding was assessed. Pulse and blood pressure of patients were monitored. Patients were treated on an emergency basis. The nasal cavity was inspected with the help of a nasal speculum and suction of any blood clots was done. Bleeding points were identified and sprayed with lidocaine. The bleeding area was cauterized with a silver nitrate stick or electrical cautery for a few seconds. Antibiotic ointment was applied at the site of cautery to both groups. The patient was discharged on cessation of bleeding. A Performa was given to patients to fill 48 hours, 1 week, and 2 weeks after the procedure containing questions regarding relief of symptoms. Recurrent bleed was diagnosed on a history of separate bleed from nose post-procedure that was sudden in onset, with an identifiable bleeding point on inspection by speculum, total duration of all episodes in previous 24 hours less than 30 minutes.

**Results:** A total of 90 cases (45 in each group) were taken. The mean age was calculated and found 34.42±8.70 in Group-A and 34.29±8.94 years for group B., The male patients were 32 (71.11%) in Group-A and 30 (66.67%) in Group-B while females were 13 (28.89%) in Group-A and 15 (33.33%) in Group-B, efficacy between chemical and electrical cautery in patients with reference to frequency of bleeding was 42 (93.33%) in Group-A and 35 (77.78%) in Group-B, the p value was calculated as 0.03 which shows a significant difference.

**Conclusion:** This study concluded that the efficacy of electrical cautery is significantly higher than chemical cautery in the management of epistaxis. However, some other trials on larger sample size are required to validate the findings of this study.

**Keywords:** Anterior epistaxis, Management, Chemical, and electrical cautery, Efficacy.

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## 1. Introduction

Epistaxis is defined as bleeding from the nostril, nasal cavity, or nasopharynx. Nosebleeds are due to the bursting of a blood vessel within the nose. Nosebleeds can be divided into 2 categories, based on the site of bleeding: anterior (in the front of the nose) or posterior (in the back of the nose).

Anterior epistaxis is more common than posterior epistaxis. It usually arises either from Kiesselbach's plexus, a rich vascular anastomotic area formed by

end arteries, or from the vein (retrocolumellar vein). More than 90% of bleeds occur anteriorly and arise from Little's area, where the Kiesselbach plexus forms on the septum.<sup>7</sup>

It is the most common emergency of otolaryngology. Major causes of epistaxis are nose picking, trauma, infection, and hypertension.<sup>2,3</sup> Epistaxis appears to have a bimodal age distribution, with most cases occurring before age 10 or between 45 and 65 years of age.<sup>9</sup>

Epistaxis is a common problem, occurring in up to 60 percent of the general population.<sup>6</sup> Epistaxis can be due to both systemic and local factors. Local causes include inflammatory, infective, traumatic, anatomical (deviated nasal septum, septal spur), chemical, or climatic changes, neoplasm, and foreign body. Similarly, the systemic causes of epistaxis are hematological diseases causing coagulopathy, cardiovascular diseases such as hypertension and vascular heart disease, liver disease, renal disease, and anticoagulant drugs. However, in the majority (80–90%) of patients, no identifiable cause is found and is labeled as “idiopathic”.

Survey data suggest that although 60 percent of adults have experienced an epistaxis episode, only 10 percent have required medical attention.<sup>7</sup> Epistaxis is a common otolaryngologic cause of hospital admission, although surgical intervention is rarely needed.<sup>8</sup> Among hospitalized patients, there is male predominance prior to age 49, after which the sex distribution equalizes. This phenomenon has been attributed to a protective effect of estrogen in women, whether in fostering a healthy nasal mucosa or in preventing vascular disease more generally.<sup>12,13</sup>

Different treatment options are available for the management of anterior epistaxis. Among these electrical and chemical cautery are commonly followed. Electrical cautery is a process in which tissue is burnt using a metal probe heated by an electric current. Many chemicals are used frequently in cautery i.e. Silver nitrate, Trichloroacetic acid, etc.<sup>1</sup>

Previous studies showed that electrical and chemical cautery is equally effective procedures for controlling epistaxis. The rationale of this study is to conclude which procedure is therapeutically better in preventing recurrent bleeding so that it could be set as a management protocol in cases presenting with anterior epistaxis.

## 2. Materials & Methods

A Randomized Control Trial (RCT) study of six months from 03-08-2019 to 03-02-2020 was conducted in ENT Department, Benazir Bhutto Hospital, Rawalpindi. The sample size for the participation of this study was taken 90 patients (45 patients in each group), by keeping the level of significance at 5% power of the test ( $1-\beta$ ) = 80%, and the Anticipated

population (P1) = 95.6% (P1=electrical cautery) 1, Anticipated Population Proportion (P2) = 76.0% (P2 = chemical cautery) 4 and the data was collected by using the consecutive (non-probability) sampling technique. Patients of both genders having ages ranging from 12 to 60 years presenting in an emergency with epistaxis (bleeding from nose, sudden onset, identifiable bleeding points on spectrum examination) were included in the study. While the patients with comorbid diseases i.e. hypertension, diabetes, coagulopathies, tumors, and post-traumatic or postoperative were excluded from the study. Alcohol-consuming patients or taking warfarin, NSAID were also excluded from the study.

After the approval of the Ethical Committee, a total of 90 cases of anterior epistaxis were randomly divided into two groups A (Electrical cautery) and B (Chemical cautery) by using a random number trial with 45 in each group. The procedure and its risk ratio benefits were explained to every patient and written informed consent was taken from every participant. A detailed history of epistaxis was taken from every patient presenting in an emergency. The site of bleeding was assessed. The pulse and blood pressure of the patients were monitored. Patients were treated on an emergency basis. The nasal cavity was inspected with the help of a nasal speculum and suction of any blood clots was done. Bleeding points were identified and sprayed with lidocaine 2 percent. Bleeding area was cauterized with a silver nitrate stick or electrical cautery for a few seconds. Antibiotic ointment was applied at the site of cautery to both groups. Patients were discharged on cessation of bleeding. A performa was given to all patients to fill 48 hours, 1 week, and 2 weeks after the procedure containing questions regarding relief of symptoms. All the data was entered in SPSS 17 and analyzed. The results of qualitative variables were described in mean $\pm$ SD. For quantitative i.e. gender distribution and efficacy, the frequencies and percentages were calculated. For the comparison of efficacy between the groups, the chi-square test was applied. The level of significance was considered  $p < 0.05$ . The stratification of age and gender was done for the control of the effect modifier. Post-stratification chi-square test was applied to keep the  $p$ -value  $\leq 0.05$  as significant.

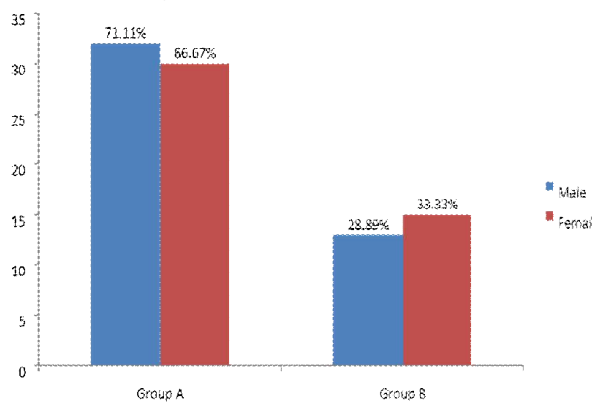
**3. Results**

Age distribution of the patients was done group-wise mostly were in the age group 12 to 40 years n=31 (68.89%) in group A and n=29 (64.4%) in group B.

**Table 1: Age Distribution (n=90)**

Age (in years)	Group-A (n=45)		Group-B (n=45)	
	No. of patients	%	No. of patients	%
12-40	31	68.89	29	64.44
41-60	14	31.11	16	35.56
<b>Total</b>	<b>45</b>	<b>100</b>	<b>45</b>	<b>100</b>

The mean age of the patients was found 34.42±8.70 years of Group-A and 34.29±8.94 years was in B. Genders wise distribution for the patients of each group is shown in figure one below.



**Figure 1: Male and female patients in group A and Group B**

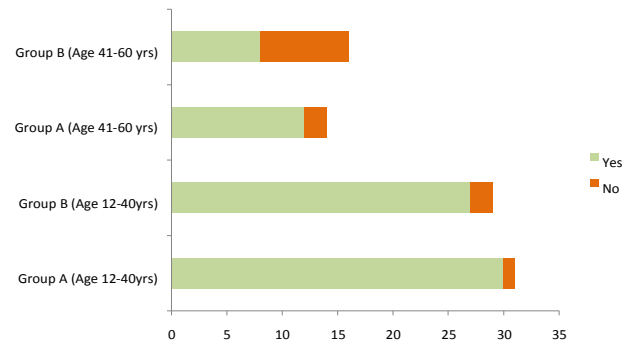
A comparison of efficacy between chemical and electrical cautery in patients presenting with anterior epistaxis in terms of frequency of bleeding was done, and the p-value was calculated as 0.03 showing a significant difference. (Table 2)

**Table 2: Comparison of efficacy between chemical and electrical cautery in patients presenting with anterior epistaxis in terms of frequency of bleeding (n=90)**

Efficacy	Group-A (n=45)		Group-B (n=45)		p-value
	No. of Patient	Percent age	No. of Patient	Percent age	
Yes	42	93.33%	35	77.78%	0.03
No	3	6.67%	10	22.22%	

<b>Tot</b>	<b>45</b>	<b>100%</b>	<b>45</b>	<b>100%</b>
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The data were stratified for age to control the effect modifiers and show the efficacy, the significant value was noted in the age group 41 to 60 years as the p-value reported 0.05 (shown in figure 2 below) while the p-value was calculated for the age group 12 to 40 years found 0.60.



**Figure 2: Stratification for efficacy with Regards to Age**

The data were also stratified for gender to control the effect modifiers and to show the efficacy results of gender wise and the p-value was also calculated for it. The detail is shown in Table 3 below:

**Table 3: Stratification for efficacy with regards to gender**

Group	Efficacy in Male Patients		p-value
	Yes	No	
A	29	3	0.17
B	23	7	
Group	Efficacy in Female Patients		p-value
	Yes	No	
A	13	0	0.22
B	12	3	

**4. Discussion**

Epistaxis is one of the commonest emergencies in the ENT Department. It is relatively benign, but sometimes it can produce serious, life-threatening situations. Up to 60% of the population is estimated to have had at least one episode of epistaxis at some point in their lives.

There are no specific defined protocols for the controlling of epistaxis, while different methods are available for the management of epistaxis such as local pressure, nasal packing, vasoconstrictor (Topical), chemical/electric cauterization, embolisation/ ligation of vessels.

The current study was planned considering the fact that previous studies showed that electrical and chemical cautery is equally effective procedures for controlling epistaxis, however, it was required to conclude which procedure is therapeutically better in preventing recurrent bleeding in our population.

In this study, out of 90 cases (45 in two groups), 68.89%(n=31) in Group-A and 64.44%(n=29) in Group-B were between 12-40 years of age while 31.11%(n=14) in Group-A and 35.56%(n=16) in Group-B were between 41-60 years of age, mean+sd was calculated as 34.42+8.70 and 34.29+8.94 years in Group-A and B respectively, 71.11%(n=32) in Group-A and 66.67%(n=30) in Group-B were male and 28.89%(n=13) in Group-A and 33.33%(n=15) in Group-B were females, comparison of efficacy between chemical and electrical cautery in patients presenting with anterior epistaxis in terms of frequency of bleeding was done, it shows that 93.33%(n=42) in Group-A and 77.78%(n=35) in Group-B, the p-value was calculated as 0.03 showing a significant difference.

To compare this study with previous comparative studies conducted in past to find the best modality among these two methods. One of the studies conducted at CMH Multan and PNS Shifa Karachi showed that epistaxis was controlled in 95.6% of cases in a single visit, while 91.3% of cases were effectively managed with chemical cautery. The rate of recurrent bleeding in electrical cautery and chemical cautery were 4.3% and 8.7% respectively.<sup>1</sup> Electrical cautery is considered the first choice of treatment in some centers as treatment failure leads to increased cost and repetitive discomfort.<sup>2</sup>

A study conducted on the effectiveness of chemical cautery showed that complete control of epistaxis was obtained in 76% of patients after the first chemical cauterization. They concluded silver nitrate cauterization is an effective, feasible, and preferable method.<sup>4</sup>

Our findings are in agreement with Felek SA and others<sup>4</sup> who recorded 24% of the cases that were not treated effectively in agreement with our study i.e. 22.22%. A study by Toner JG, Walby AP<sup>21</sup> also shows that electro-cautery was superior to chemical cautery in the treatment of epistaxis, a prospective randomized study assessed the effectiveness of electro-cautery and cautery with silver nitrate.

In another study conducted by Urvashi Razdan et al,<sup>22</sup> to assess the efficacy of conservative modalities in the

management of epistaxis, in their study, cauterization was done in 222 (74%) patients and was successful in 160 (72.07%) of them, silver nitrate was used as the cauterization (47.7%) patients and was successful in 77(72.6%). Very high figures of up to 86.8% have also been noted by Padgham and related.<sup>23,24</sup>

## 5. Conclusion

Though, the findings of this study justify the hypothesis that "Efficacy of electrical cautery is better than chemical cautery in management of epistaxis" is justified but considering the smaller sample size in this study and most of the previous studies, it is further required that these findings may be validated through some other trials on larger sample size.

The study concluded that the efficacy of electrical cautery is significantly higher than chemical cautery in the management of epistaxis. However, some other trials on a larger sample size are required to validate the findings.

**CONFLICTS OF INTEREST-** None

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**Potential competing interests:** None to report

**Contributions:**

T.I- Conception of study

T.I- Experimentation/Study conduction

T.I, M.U.A, S.A, H.A, Z.S, S,Y-

Analysis/Interpretation/Discussion

A.F- Manuscript Writing

S.A, H.A, S,Y- Critical Review

S.A, A.F, Z.S- Facilitation and Material analysis

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