ORIGINAL ARTICLE

Comparison of Topical Treatments and Chemical Cauterization for Recurrent Anterior Epistaxis in Pediatric Patients

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ABSTRACT

Objective: To compare the effectiveness of topical treatment methods versus chemical cauterization in managing recurrent anterior epistaxis in pediatric patients.

Study Design: Comparative cross sectional study design

Place and Duration of Study: ENT Department of Imran Idrees Teaching Hospital, Sialkot, from 15th June 2023 to 30th December 2023.

Materials and Methods: Eighty individuals, aged 5 to 18 years, with recurrent anterior epistaxis (≥4 episodes in the past month) were enrolled in the study and randomly assigned to two groups using a lottery method. Patients with coagulation disorders, chronic nasal conditions, autoimmune diseases, use of anticoagulant medications, or significant nasal structural abnormalities were excluded. Group A (n=40) underwent 75% silver nitrate chemical cautery of the anterior nasal septum, while Group B (n=40) received a week-long topical treatment consisting of 0.05% xylometazoline and a local oil-based antibacterial ointment. All patients were monitored for one month after treatment, with follow-up visits scheduled for two and four weeks. Data were analyzed using SPSS version 23, with quantitative variables expressed as mean ± standard deviation and qualitative variables as frequencies and percentages. The chi-square test was used to compare treatment efficacy with statistical significance set at $p < 0.05$.

Results: The average age of study participants was 14.24 ± 2.620 years. There were 43 (40%) men and 48 (60%) women patients. The therapy was effective in 75% of Group A and in 65% of Group B.

Conclusion: Although chemical cauterization resulted in a higher number of successful cases, there was no statistically significant difference between chemical cauterization and local antiseptic ointment at the 30-day post-treatment mark. Consequently, local antiseptic ointment can be considered a viable alternative when cauterization is not feasible.

Key Words: *Cauterization , Efficacy, Epistaxis, Topical Treatment.*

Introduction

Epistaxis, commonly known as nosebleeds, is one of the most frequently encountered emergencies in otolaryngology and has been recognized in medical literature for centuries.[1,2] It affects individuals of all ages, with a prevalence ranging from 10% to 60%. While most cases are mild and self-limiting, approximately 7% to 14% require medical intervention due to significant blood loss, recurrent episodes, or underlying medical conditions.[3] Epistaxis is classified as anterior or posterior, with anterior epistaxis being the most common type, accounting for nearly 80% of cases. It originates from Kiesselbach's plexus in the anterior nasal septum and is frequently seen in children and young adults.[4] Posterior epistaxis, which arises from branches of the sphenopalatine artery, is more severe and occurs more often in older adults.[5] Various local and systemic factors contribute to epistaxis, including nasal trauma, allergic rhinitis, infections, digital manipulation, hypertension, and anticoagulant use.[6] Several treatment modalities have been developed to manage recurrent anterior epistaxis effectively. Chemical cauterization using silver nitrate is widely practiced due to its ability to induce localized tissue coagulation, sealing bleeding vessels and reducing

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recurrence.[7] Another approach involves topical agents, such as vasoconstrictors and antiseptic ointments, which help control bleeding by constricting blood vessels and promoting mucosal healing. Both chemical cauterization and topical treatments have shown effectiveness, but there is no consensus on which method provides superior long-term outcomes. Some studies suggest that chemical cautery offers a more definitive resolution by directly targeting the bleeding site, while others argue that topical treatments provide a less invasive and equally effective alternative with fewer complications.[8,9]

Despite the availability of these treatments, there remains a lack of comparative studies evaluating their efficacy, particularly in pediatric patients. Most existing research on recurrent epistaxis has been conducted in Western populations, where healthcare settings and patient demographics differ significantly from those in developing countries.[10] This limits the generalizability of findings to resource-limited environments, such as Pakistan, where access to specialized interventions may be restricted. Furthermore, while individual studies have examined the effects of chemical cautery and topical therapy separately, few have directly compared their effectiveness in a controlled clinical setting. This gap in knowledge makes it challenging for clinicians to make evidence-based treatment decisions, particularly for pediatric patients who may have different healing responses and treatment tolerances than adults.

To address this gap, this study was conducted to compare the efficacy of 75% silver nitrate chemical cautery with a combination of 0.05% xylometazoline and an oil-based antiseptic ointment in managing recurrent anterior epistaxis in pediatric patients. By assessing treatment success rates and recurrence over a defined follow-up period, the study aimed to provide empirical evidence to guide clinical decision-making and contribute to the development of evidence-based treatment protocols. The objective of this study was to assess and compare the effectiveness of chemical cautery and topical therapy in managing recurrent anterior epistaxis in pediatric patients.

Materials and Methods

This comparative interventional study was conducted at Imran Idrees Teaching Hospital, Sialkot, from June 2023 to December 2023. Ethical approval was obtained from the hospital's Ethical Review Committee (Ref: 2023/IITH/RA/0014). Written informed consent was obtained from the parents or guardians of all participants before enrollment in the study. To maintain anonymity and confidentiality, each participant was assigned a unique identification code, and all personal data were kept anonymous throughout the study. Patients aged 5 to 18 years with recurrent anterior epistaxis, defined as at least four episodes of nasal bleeding in the previous month, were included in the study. Patients with specific comorbidities that could influence epistaxis severity or treatment outcomes were excluded. These included coagulation disorders, chronic nasal conditions (e.g., chronic rhinosinusitis, nasal vestibulitis), use of anticoagulant medications (e.g., warfarin, aspirin), autoimmune disorders and significant nasal structural abnormalities (e.g., severe septal deviation, nasal polyps). Patients who met the inclusion criteria were randomly assigned to two groups using a lottery method. Group A patients received 75% silver nitrate chemical cautery of the anterior nasal septum, while Group B patients were treated with a one-week course of topical therapy consisting of 0.05% xylometazoline and a local oil-based antiseptic ointment. The procedures were performed by experienced ENT specialists with a minimum of five years of clinical expertise in managing epistaxis, ensuring standardized and skillful application of both treatment modalities. Initially, a vasoconstrictor spray was applied, followed by the ointment, which was administered to the septum as far as possible using the little finger. All patients were provided with a local antibiotic ointment for one-week post-procedure. Follow-up assessments were conducted two and four weeks after treatment under the supervision of senior ENT faculty members.

Data were collected through structured clinical assessments and follow-up evaluations conducted by trained ENT residents under the supervision of senior faculty members. Each patient's demographic details, medical history, and treatment response were recorded on a standardized data collection form. Follow-up assessments were conducted at two- and four-week post-treatment, during which

patients were evaluated for symptom resolution and recurrence of epistaxis. Data was entered and analyzed using SPSS version 23. Quantitative variables were expressed as mean ± standard deviation, while qualitative variables were presented as frequencies and percentages. The chi-square test was used to compare the efficacy of treatments, with a p-value of <0.05 considered statistically significant.

Results

The mean age of the patients was 14.24±2.62 years, with a range from 5 to 18 years. There was no significant difference in the mean age between the two groups, with Group A having a mean age of 14.20±2.77 years and Group B having a mean age of 14.28±2.50 years. The study included a total of 80 patients, comprising 32 males (40%) and 48 females (60%), with no significant gender distribution differences between the groups, as shown in Table I and Table ll provides a summary of the treatment efficacy in both groups. In Group A, 30 patients (75.0%) found the treatment effective, while 10 patients (25.0%) did not. In Group B, 26 patients (65.0%) reported effective outcomes, while 14 patients (35.0%) did not. Overall, 56 patients (70.0%) experienced effective treatment outcomes, with no significant difference between the groups (P = 0.329).

Table I: Demographic Data of Study Subjects (n= 80)

Group	Group A (n=40)	Group B (n=40)	Total	P Value
Male	17 (42.5%)	15 (37.5%)	32 (40.0%)	0.648
Female	23 (57.5%)	25 (62.5%)	48 (60.0%)	
Age (years)	14.20±2.77	14.28±2.50	14.24±2.62	0.778

Table II: Efficacy Among the Subjects

Efficacy	Group A	Group B	Total	P Value
Effective	30 (75.0%)	26 (65.0%)	56 (70.0%)	0.329
Not Effective	10 (25.0%)	14 (35.0%)	24 (30.0%)	

Discussion

This study aimed to evaluate the efficacy of two treatment modalities chemical cauterization and topical therapy in managing recurrent anterior epistaxis, as no prior research in Pakistan has compared these approaches.

The findings of this study align with previous research on the management of recurrent anterior epistaxis, further supporting the efficacy of both chemical cauterization and topical therapy. Several studies have demonstrated comparable success rates between these two treatment approaches. For instance, Özmen and Özmen found that while chemical cauterization had a slightly higher initial success rate, long-term recurrence rates were similar to those of topical treatment, reinforcing the idea that both methods offer effective symptom control.[7] Similarly, a study by Chaitanya et al. comparing different concentrations of silver nitrate for cautery reported that while cauterization provided immediate hemostasis, the long-term benefits of antiseptic ointments and nasal decongestants were comparable.[12] Additionally, research by Vis and van den Berge highlighted that non-invasive treatments, such as antiseptic ointments, can be effective alternatives to nasal packing or cauterization, particularly in patients with mild to moderate epistaxis.[10] These parallels with existing literature strengthen the credibility of our findings and emphasize the need for individualized treatment selection based on patient preferences, tolerability, and clinical presentation.

The study found that chemical cauterization was effective in 75% of cases, while topical treatment achieved a 65% success rate. Although the cautery group showed a higher success rate, the difference between the two groups was not statistically significant. These findings are consistent with previous research by Robertson and Kubba, who reported superior long-term outcomes with antiseptic nasal cream alone compared to cautery combined with antiseptic treatment.[16] Similarly, a study by Qureshi and Burton concluded that various treatment modalities, including antiseptic creams and chemical cautery, did not demonstrate significant differences in efficacy.[17]

These results contribute to the existing body of evidence by reinforcing that both treatment approaches are effective, with chemical cauterization showing a slight advantage. However, the lack of a statistically significant difference suggests that topical therapy remains a viable alternative, offering a less invasive option for patients. This flexibility is particularly valuable for individuals in whom cauterization is impractical due to discomfort, medical contraindications, or

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resource limitations.[13,14,15]

Further research with larger, multicenter trials is necessary to validate these findings and examine additional factors affecting treatment outcomes, such as epistaxis severity, recurrence rates, and patient adherence. Long-term follow-up studies would help assess the durability of treatment effects and compare cost-effectiveness. Additionally, evaluating patient preferences and quality of life after treatment could provide further insights into optimizing management strategies for recurrent anterior epistaxis.

The study has certain limitations. The relatively small sample size of 80 patients may restrict the generalizability of the findings. Additionally, as research was conducted at a single hospital in Sialkot, the results may not be applicable to other populations. The one-month follow-up period may be insufficient to assess long-term recurrence rates, and the study focused solely on specific treatment protocols, potentially overlooking other therapeutic options. Despite measures to reduce bias, observer bias could still have influenced the outcomes. Addressing these limitations in future studies would enhance the robustness of findings and provide clearer guidance for clinical practice.

Conclusion

Although there were more patients who improved with chemical cauterization in our research, there was no significant difference between local antiseptic ointment and chemical cauterization on the 30th day of therapy. So, if cauterization is not an option, local antiseptic ointment might be utilized as an alternative.

Conflict of Interest: The authors have no conflicts of interest to declare.

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REFERENCES

1. Alqarni ZM, Alajmi TA, Alhumaidi HH, AlharethAlhussain YM, Alzahrani HS. Prevalence, causes, treatment, and outcome of epistaxis. Age [Internet]. 2019 [cited 2024 Feb 5];60:30. doi: 10.24911/IJMDC.51-1546952315
2. Bequignon E, Vérillaud B, Robard L, Michel J, Escabasse VP, Crampette L, et al. Guidelines of the French Society of Otorhinolaryngology (SFORL). First-line treatment of epistaxis in adults. Eur Ann Otorhinolaryngol Head Neck Dis [Internet]. 2017 [cited 2024 Feb 5];134(3):185-9. doi: 10.1016/j.anorl.2016.09.008
3. Alkhalifah KM, Alhumaidan NI, Alotaibi TA, Almnjwami RFM, Alzelfawi LA, Almughamsi RH, et al. A systematic review and meta-analysis of the awareness of and attitudes toward epistaxis. Cureus [Internet]. 2023 [cited 2024 Feb 5];15(10). doi: 10.7759/cureus.46590
4. Gouripur K, Patil MN, Malashetti S. Study of risk factors and treatment methods in patients presenting with epistaxis to a tertiary care hospital in North Karnataka [Internet]. 2023 [cited 2024 Feb 5].
5. Tunkel DE, Anne S, Payne SC, Ishman SL, Rosenfeld RM, Abramson PJ, et al. Clinical practice guideline: nosebleed (epistaxis). Otolaryngol Head Neck Surg [Internet]. 2020 [cited 2024 Feb 5];162. doi: 10.1177/0194599819890327
6. Helmy MR, Ahmed HE-S, AbdelWahab AA. Local sclerotherapy with lauromacrogol versus chemical cautery with chromic acid in treatment of idiopathic recurrent anterior epistaxis. Egypt J Neck Surg Otorhinolaryngol [Internet]. 2020 [cited 2024 Feb 5];6(3):12-8. doi: 10.21608/EJNSO.2021.139667
7. Özmen S, Özmen ÖA. Is local ointment or cauterization more effective in childhood recurrent epistaxis? Int J Pediatr Otorhinolaryngol [Internet]. 2012 [cited 2024 Feb 5];76(6):783-6. doi: 10.1016/j.ijporl.2012.02.040
8. Misra A, Basu A, Mandal PK, Mahapatra NC. Management of pediatric epistaxis in different age groups in a tertiary care centre. Int J Contemp Pediatr [Internet]. 2016 [cited 2024 Feb 5];3(4):1206-9. doi: 10.18203/2349-3291.ijcp20162418
9. Andreeff R. Epistaxis. JAAPA [Internet]. 2016 [cited 2024 Feb 5];29(1):46-7. doi: 10.1097/01.JAA.0000473373.47749.5f
10. Mylonas S, Skoulakis C, Nikolaidis V, Hajiioannou J. Epistaxis treatment options: literature review. Indian J Otolaryngol Head Neck Surg [Internet]. 2023 Sep [cited 2024 Feb 5];75(3):2235-44 doi: 10.1007/s12070-023-03824-z.
11. Ahmed AE, Abo El-Magd EA, Hasan GM, El-Asheer OM. A comparative study of propranolol versus silver nitrate cautery in the treatment of recurrent primary epistaxis in children. Adolesc Health Med Ther [Internet]. 2015 Sep 30 [cited 2024 Feb 5]:165-70. doi: 10.2147/AHMT.S84806
12. Chaitanya V, Manampuram MT, Sreelakshmi PS, Sreedevi NT. Comparative study of topical application of injection tranexamic acid and anterior nasal packing in the management of epistaxis. Indian J Otolaryngol Head Neck Surg [Internet]. 2024 Apr 5 [cited 2024 Feb 5]:1-5 doi: 10.1007/s12070-023-03345-9.
13. Shahsavarinia K, Faridaalaee G, Ahranjani RE, Balafar M, Milanchian N, Hajebrahimi S, et al. What is the best management for geriatric epistaxis? A comprehensive systematic review and meta-analysis. Int J Drug Res Clin [Internet]. 2023 Jul 7 [cited 2024 Feb 5];1(1):e11. doi: 10.34172/ijdrc.2023.e11.
14. EL-Baz HM, Mohammed KA, Said HS. Risk factors of epistaxis in primary school children in Dakahlia Governorate, Egypt. Egypt J Hosp Med [Internet]. 2021 Oct 1 [cited 2024 Feb 5];85(2):4035-41. doi: 10.21608/EJHM.2021.207085
15. Li T, Li F, Cha X, Wang S, Yan J, Wang T, et al. systematic

review and meta-analysis of the effects of topical tranexamic acid versus topical vasoconstrictors on the management of epistaxis. Curr Pharm Des [Internet]. 2023 May 1 [cited 2024 Feb 5];29(19):1497-503 doi: 10.2174/1381612829666 230214093136.
16. Robertson S, Kubba H. Long-term effectiveness of antiseptic cream for recurrent epistaxis in childhood: five-year follow-up of a randomized, controlled trial. J Laryngol Otol [Internet]. 2008 [cited 2024 Feb 5];122(10):1084-7. doi: 10.1017/S0022215107001600
17. Chiang CY, Lin JS, Tsai TY, Tu YK, Tsai MJ. Comparative effectiveness of various noninvasive local treatments in patients with epistaxis: A systematic review and network meta-analysis. Acad Emerg Med [Internet]. 2023 Oct [cited 2024 Feb 5];30(10):1047-58.

CONFLICT OF INTEREST

Authors declared no conflicts of Interest.

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DATA SHARING STATEMENT

The data that support the findings of this study are available from the corresponding author upon request.