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Is local ointment or cauterization more effective in childhood recurrent epistaxis

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ABSTRACT

Objectives: To compare the efficacy of nasal antiseptic ointment and silver nitrate cautery in the treatment of children with recurrent epistaxis.

Methods: In this prospective and randomized study, a hundred children with recurrent epistaxis were assigned into two groups. In group 1, patients underwent silver nitrate cauterization, in group 2 patients were treated with nasal antiseptic ointment (oxytetracycline hydrochloride-polymyxin B sulfate); and both groups were followed for 3 months. All of the patients were investigated for allergy with skin prick test.

Results: The ages of patients were similar in both groups (group 1: 9.2 ± 2.7 ; group 2: 8.2 ± 2.2 ; $p = 0.069$). Thirty-eight percent of the patients in group 1 and 52% of the patients in group 2 had epistaxis in the three months follow-up. The difference between groups was not significant ($p = 0.159$). Thirteen (26%) of the patients in group 1 and 12 (24%) of the patients in group 2 were found to have allergic symptoms and positive prick test. The rate of allergy was similar in both groups ($p = 0.817$).

Conclusion: Nasal antiseptic ointment and silver nitrate cauterization were found to have similar outcomes in the treatment of recurrent epistaxis.

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1. Introduction

Recurrent idiopathic epistaxis (nosebleeds) in children is repeated, self-limiting nasal bleeding in patients up to the age of 16 for which no specific cause has been identified. Recurrent bleeding episodes are a source of significant distress and anxiety in children, their carers and clinicians. Therefore, such nosebleeds are a common cause of morbidity and hospital referral.

Thirty percent of all children aged 0–5 years, 56% of those aged 6–10 years, and 64% of those aged 11–15 years have had at least one episode of epistaxis in their lifetime [1], while 56% of adults with recurrent nosebleeds had problems in childhood [2].

Childhood recurrent idiopathic epistaxis is usually attributed to crusting, nasal vestibulitis (an infection of the skin of the nasal vestibule producing soreness, inflammation, fissuring and encrustation), and/or digital trauma ('nose picking'), although in many cases no direct cause can be established [3–5]. Nasal colonization with *Staphylococcus Aureus* is also thought to play a role, and this has obvious relevance to treatment with antiseptic cream [6].

The relative efficacy of various treatments for recurrent childhood epistaxis has been investigated in numerous studies. Evidence from randomized, controlled trials shows that

chlorhexidine–neomycin cream (Naseptin®, Alliance Pharmaceuticals Limited, Chippenham, Wiltshire, UK) is more effective than no treatment [7], chlorhexidine–neomycin cream is as effective as cautery alone [8], chlorhexidine–neomycin cream is as effective as combination treatment with cautery and chlorhexidine–neomycin [9] and petroleum jelly is no more effective than simple observation [10]. Silver nitrate cautery with antiseptic cream appeared to give a small but statistically significant benefit when compared to antiseptic cream alone [11].

The aim of the present study was to compare the efficacy of nasal antiseptic ointment (oxytetracycline hydrochloride-polymyxin B sulfate) and silver nitrate cauterization.

2. Materials and methods

The present study was planned as a prospective, randomized clinical trial. Between January 2008 and December 2009, 100 patients (41 female, 59 male), with recurrent epistaxis who met all eligibility criteria were enrolled in this study. The Ethical Committee of Bursa Dörtçelik Children Hospital has approved the design of the study. The criteria for inclusion were (1) history of repeated nose bleedings with at least 4 episodes in the preceding 4 weeks, with the most recent episode within the last two weeks and (2) presence of a localized bleeding source in the little area. Exclusion criteria were (1) presence of bleeding disorder, (2) history of nasal cautery or pharmacological local treatment for epistaxis during the previous 4 weeks, (3) presence of acute upper

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respiratory infection or active chronic rhinosinusitis. Informed consent was obtained from the parents after the detailed explanation of the study.

An initial questionnaire was filled out by the clinician on every patient during the clinic visit. A record of the name, age, sex, frequency of symptoms, any previous local treatment, presence of allergic symptoms and method of current treatment was made.

A routine ENT examination was performed on all children with special attention to evaluate the source of bleeding, presence of rhinitis, sinusitis or tumoral lesion.

Complete blood count and coagulation parameters (prothrombin time, activated plasma thromboplastine time) were screened. All patients were consulted to department of hematology in order to rule out any bleeding disorder. Allergy to common local inhalant allergens was analyzed with skin prick tests.

The children were randomized into two groups using sealed envelopes. All patients were evaluated by SÖ. Randomization was performed by office nurse. Two hundred opaque envelopes were numbered sequentially from 1 to 200. A table of random numbers was then used to generate the group assignment; if the last digit of the random number was between 0 and 4, the assignment was to group 1, and if the last digit was between 5 and 9, the assignment was to group 2. The assignments were then placed into the opaque envelopes, and the envelopes sealed. As eligible children were entered into the trial, these envelopes were opened in sequential order to give each child their random group assignment. The envelopes were opened after parents had given consent, just prior to nasal cautery being performed.

Patients in group 1 underwent chemical nasal cauterization using silver nitrate sticks. Prior to cauterization I topical anesthesia was performed by application of cotton pledgets soaked in 2 ml of 10% lidocaine (xylocaine 10% spray, AstraZeneca ilaç San. Ve Tic. Ltd. Şi. İstanbul-Türkiye) in the nasal cavities for 10 min. Cautery was then performed by holding the bead of the silver nitrate stick (75% silver nitrate, 25% potassium nitrate, Selam Medical Ltd, İstanbul, Türkiye) against the offending vessel for a few seconds until a white precipitate formed and obliterated all signs of the source of bleeding. Care was taken to ensure that cautery was applied to the area in question only and did not extend to the surrounding normal nasal mucosa.

In group 2, patients were assigned to receive local antiseptic ointment containing oxytetracycline hydrochloride-polymyxin B sulfate (Terramycin-Pfizer İlaçları Ltd. Şi. İstanbul-Türkiye) for 2 weeks. They were instructed to apply two squirts of cream in one or both nostrils and pinch the nostrils together for a few seconds thereafter to allow distribution of the cream against the nasal septum.

Patients were re-evaluated at 2nd, 8th and 12th weeks. Presence and frequency of bleeding was questioned and patients were re-examined for a focus of bleeding and any sign of septal mucosal ulceration, necrosis or perforation.

The outcome measure for the study was taken as the complete resolution of epistaxis in the follow-up. Patients with persisting episodes of epistaxis despite treatment were accepted as treatment failure and another scheme of treatment was ordered.

Statistical analysis was performed using SPSS for windows version 13 (SPSS Inc, Chicago, USA). Chi square test was used for the analysis of categorical data. Kolmogorov–Smirnov test was used to evaluate the normal distribution of the continuous data. In case of normal distribution independent samples *T* test was used, Mann–Whitney *U* test was employed otherwise. A *p* value <0.05 was accepted as level of statistical significance.

We regarded an absolute difference in the order of 25% as being of significant clinical importance to favor a group. To have a 75% power to exclude a difference of this magnitude at a 5% significance level, a total of 100 patients would be required.

Table 1

The comparison of demographic variables and treatment outcome of the groups.

	Silver nitrate (group1)	Antiseptic ointment (group 2)	
Number of patients	50	50	
Mean age (years)	9.2 ± 2.7	8.2 ± 2.2	<i>p</i> = 0.069
Male	28	31	<i>p</i> = 0.542
Female	22	19	<i>p</i> = 0.542
Recurrent epistaxis after treatment	19 (38%)	26(52%)	<i>p</i> = 0.159

3. Results

The ages of patients were ranging between 3 and 14 years (mean ± SD: 8.7 ± 2.5). Mean age of patients was 9.2 ± 2.7 (range 3–14) in group 1 and 8.2 ± 2.2 (range 4–13) in group 2. The age distribution was similar in both groups (*p* = 0.069). There were 22 female and 28 male in group 1 and 19 female and 31 male in group 2. Sex distribution of groups was also similar (*p* = 0.542) (Table 1). The progress of children through the trial was shown in Fig. 1.

Re-bleeding was encountered in 45% of the patients whereas, 55% of the patients did not have bleeding in the follow-up period. Recurrent bleeding was experienced by 19 of the patients (38%) who were treated with cauterization whereas, 26 of the patients (52%) who used nasal ointment had recurrence of bleeding. The rate of recurrent bleeding between patients treated with different approaches was similar (*p* = 0.159) (Table 1).

In the cauterization group 31/50 (62%) had no bleeding in 3 months follow-up whereas 24/50 (48%) in the antiseptic ointment group did not experience bleeding. This equates to absolute risk reduction of 0.269 (95% confidence interval: –0.180–0.551) and relative risk reduction of 0.140 (95% confidence interval: –0.074–0.343).

The frequency of epistaxis ranged from 4 to 24 episodes per month with a mean of 10 episodes per month prior to treatment. There was no significant difference between pretreatment frequency of epistaxis between groups (*p* = 0.186). Patients who had recurrent bleeding after treatment were found to have significantly more frequent nosebleeds in the pretreatment period (14.1 ± 4.7) compared to ones who did not (6.5 ± 2.3) (*p* < 0.0001).

Thirteen of the patients in group 1 (26%) and 12 of the patients in group 2 (24%) had allergic symptoms and positive skin tests. The groups were homogenous for the presence of allergy (*p* = 0.817).

We did not encounter any complication namely, mucosal ulceration, necrosis or septal perforation in the study groups.

4. Discussion

Most children's epistaxis are self-limiting, however, more troublesome recurrent cases are a common source of referral to otorhinolaryngologists. There is no consensus on how frequent or severe recurrences warrant treatment. Once careful history has been taken to exclude bleeding secondary to systemic disease, direct examination (with or without a flexible or rigid endoscope) usually reveals an engorged vessel on the septum [12]. The most common interventions used to treat idiopathic recurrent nosebleeds in children are cautery of these vessels, and/or the application of an antiseptic nasal cream in order to reduce vestibulitis and crusting.

Silver nitrate cautery being readily available and easy to use, has gained widespread popularity [13–16]. The mode of action of silver nitrate is by acting as a strong oxidizing agent. In aqueous solution the silver cation of this salt, Ag(I), is readily reduced to neutral silver metal Ag(O) which precipitates resulting in release of free radicals [17]. The chemical stress that accompanies this reaction will oxidize organic tissue and destroy bacteria. The most

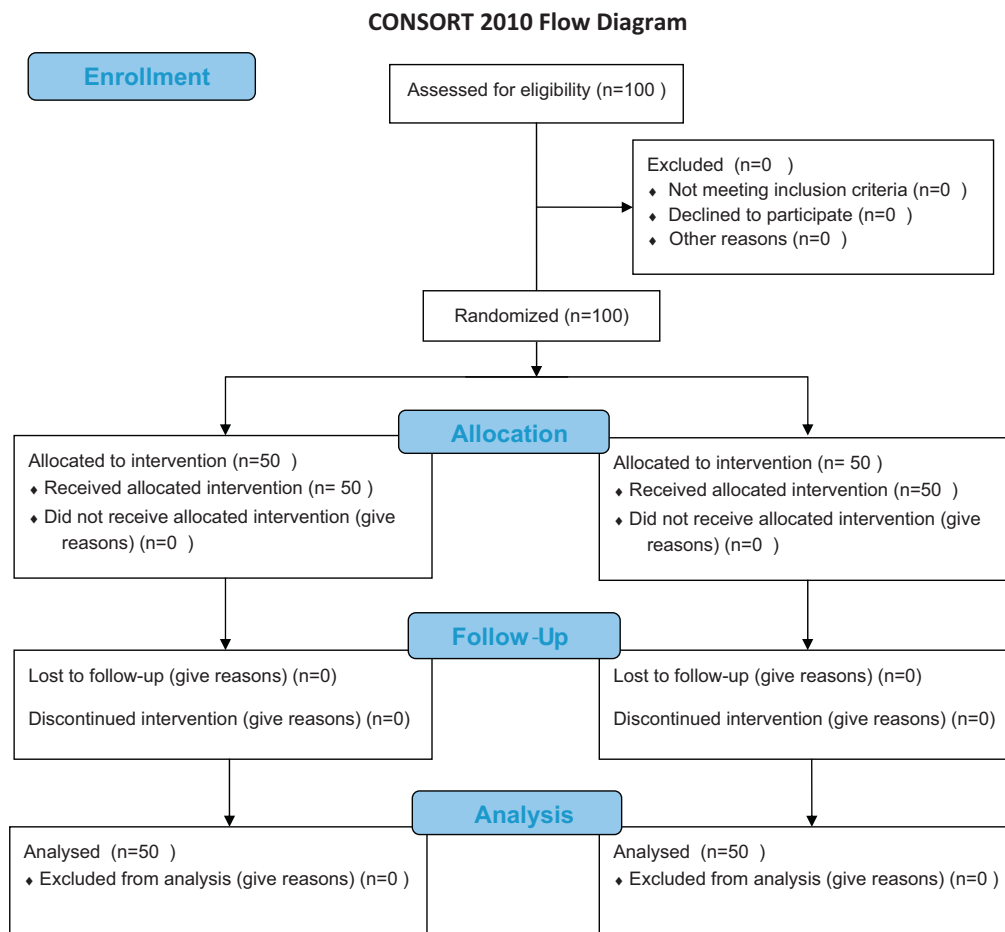


Fig. 1. CONSORT 2010 flow diagram.

common side effects of its usage are pain and recurrent epistaxis. Other occasional adverse events include septal perforation, crusting, and tattooing of the septal mucosa [18,19]. However, provided that performance complied with principles, cauterization might be employed safely.

Other treatments include; instillation of nasal saline spray [16], use of bland oils or ointments [10], topical nasal decongestant [20], intranasal sprays containing desmopressin, an anti-hemorrhagic agent [21], epsilon-aminocaproic acid [22], tranexamic acid gel [23] and fibrin sealant [24].

There are several comparisons of treatment options for epistaxis in the literature. Ruddy et al. [8], reported naseptin cream as effective as cauterization in the treatment of epistaxis. However, small sample size limited the value of this study. Murthy et al. [9], showed that nasetin cream alone was as effective as use of naseptin in combination with cauterization. The small sample size was also a weakness of this study. Moreover, results of children and adults were assessed in common. Comparing antiseptic nasal ointment (oxytetracycline hydrochloride-polymyxin B sulfate) and

silver nitrate cautery, the present study supported the asseveration that local use of cream and cauterization offered similar outcomes but as a prospective randomized study having relatively larger sample size, it provided a higher level of evidence. On the contrary, Calder et al. [11] found silver nitrate cautery with antiseptic cream to be more effective than antiseptic cream alone. Kubba et al. [7] compared patients treated with naseptin cream to patients having no treatment and reported better outcome in the treatment group. In another study, it was found that vaseline alone confers no benefit over simple observation in recurrent childhood epistaxis [10]. The current literature was summarized in Table 2.

Antiseptic ointment was not used after cauterization in order to evaluate the affect of cauterization separately. However, this might have led to a delay in the healing of vestibulitis [25]. A comparison of cauterization versus cauterization with local antiseptic is missing in the literature.

Cessation of bleeding episodes was accepted as the only outcome parameter in the present study. The rate and amount of bleeding was not used for this purpose. One reason for this

Table 2

The summary of randomized controlled trials on local ointment and cauterization used for the treatment of epistaxis in the literature.

Author	Year	Age range	Number of randomized/lost	Treatment nature	Follow-up
Ruddy	1991	3–14	48/3	Naseptin [®] versus silver nitrate	4 weeks
Murty	1999	7–79	64/14	Naseptin [®] versus naseptin [®] and silver nitrate	8 weeks
Calder	2009	1–13	109/16	Antiseptic ointment versus silver nitrate	4 weeks
Kubba	2001	3–13	103/15	Naseptin [®] versus no treatment	8 weeks
Loughran	2004	1–14	105/0	Vaseline [®] petroleum jelly versus no treatment	8 weeks
Özmen	2012	3–14	100/0	Terramycin [®] sulfate versus silver nitrate	8 weeks

preference is that patients' self reported amount of bleeding is often exaggerated and thus unreliable. We apprehended this fact in the interrogation of amount of bleeding in the pretreatment period. Accepting only cessation of bleeding as the criterion of success would have decreased the success rate of the present study, however, it is a substantial outcome as no more treatment is indicated. On the other hand, rate of bleeding episodes was derived reliably from the anamnesis and it was found to be the only factor that influenced the outcome. Hypothetically, the grade of inflammation was more severe in patients having more frequent bleeding episodes. Consequently, it is comprehensible to encounter a poorer outcome in these patients.

5. Conclusion

In the treatment of epistaxis, local antiseptic ointment and silver nitrate cauterization have similar results. The main factor affecting the outcome was found to be the frequency of bleeding which implicated the severity of the mucosal inflammation. Although, no complications were encountered in the present study, cauterization should be employed with caution, informing the patient about the associated pain, crusting and risk of septal perforation.

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