



## ORIGINAL ARTICLE

# The Investigation of the Mupirocin effect on Epistaxis treatment in Comparison with non-organic treatment with Vitamin A in children of Zahedan city in the Spring and Summer of 2010

Gholamali Dashti Khavidaki<sup>1</sup> and Aghil Absalan<sup>2,\*</sup>

<sup>1</sup>Medical Faculty, Department of Otolaryngology, Zahedan University of Medical Sciences, Zahedan, Iran

<sup>2</sup>Department of Audiology, University of social welfare and rehabilitation sciences, Tehran, Iran

\*Corresponding author: [Aghilabsalan@yahoo.com](mailto:Aghilabsalan@yahoo.com)

### ABSTRACT

*Epistaxis is a common illness in children that often causes concern in patients, parents and treating physicians. Epistaxis usually caused by factors that damage the mucosal lining of the nose or cause damage to the vessel wall or the changing clotting ability of the blood. In similar studies the effects of various drugs, including estrogen, oxymetazoline, and Trance acid amide on pediatric epistaxis have been investigated. In this study that is clinical trial study, 72 patients in the age range of 3 to 15 years in Khatamolanbia hospital in Zahedan with epistaxis problems have been divided into two groups with 36 members by blocked randomized method. In the first group, after initial control of bleeding, mupirocin topical ointment was taken 2 times a day and the second group received a topical ocular vitamin A 2 times a day. Patients were treated with drugs for 4 weeks. After the treatment period of 4 weeks at the end of each week, the numbers of episodes of epistaxis were examined for 4 weeks. Finally the results were analyzed by t-test analysis and SPSS software. Among the 72 patients in the group treated with vitamin A, 6 patients had bleeding (16.66) daily, 18 patients (15%) weekly and 12 patients (33.33%) monthly. In the group with mupirocin treatment, 4 patients (11.11%) had bleeding daily, 16 patients (44.44%) weekly and 16 patients (44.44%) monthly. In general, reduction of the amount of bleeding with vitamin A treatment was significant at  $p=0.004$  and reduction of the amount of bleeding with mupirocin treatment in  $p<0.001$  was significant and the comparison of bleeding reduction between these two drugs is not significant at  $p = 0.478$ . According to this study, mupirocin and vitamin A both separately have been effective in the treatment of non-organic epistaxis in children but based on this study, it cannot be said which one is preferred in the treatment of epistaxis.*

**Keywords:** epistaxis, children, mupirocin

Received 09.08.2014

Revised 18.09.2014

Accepted 28.10. 2014

### INTRODUCTION

Epistaxis is a common illness in children that often causes concern in patients, parents and treating physicians. Epistaxis is usually caused by factors that damage the mucosal lining of the nose or cause damage to the vessel wall or the changing clotting ability of the blood (1, 2). About 10% of people have experienced epistaxis. According to epidemiological studies, among 30% of children in the age range of 0 to 5 years, 56% in the age range of 6 to 10 years and 64% in the range age of 11 to 15 have experienced the Epistaxis. 56% of adults have experienced the Epistaxis in their childhood (3 and 4).

Similar researches have studied the effects of various drugs, including estrogen, oxymetazoline, and Trance acid amide in pediatric epistaxis (5, 6, 7). Many of these people have never gone to a doctor and less than 10% of them need to see otolaryngologists that most of them are children who their parents were worried. Despite the fact that most episodes of epistaxis were mild, but it can cause potentially dangerous complications such as aspiration, hypotension and myocardial infarction (8).

Anterior epistaxis occurs mostly in children and adolescents whereas posterior epistaxis happens in older people, particularly in men with hypertension and atherosclerosis. Epistaxis is more common in the winter months because of the increased rate of upper respiratory infections, and dry air. Nosebleeds in infants are very unusual. Epistaxis reason can be related to local or systemic complications. Probably the most common cause of epistaxis is the nasal trauma with or without fracture. Chronic irritation causes

Crust and granulation tissue that bleeds easily if it is tampered with subsequent manipulation. Other less common causes of anterior epistaxis include surgery of the nose and sinuses, barotrauma caused by diving or flying, deviated septum that interferes with the normal pattern of air flow and creates turbulent flow inside the nasal cavity, septum perforation, foreign bodies, benign and malignant tumors, angiofibroma of the nasopharynx, and cavernous portion of the internal carotid artery can also cause the repeated epistaxis. Some systemic diseases such as hypertension, blood dyspraxia or any interference in clotting factors or platelet function makes patient prone to epistaxis (9).

In treatment of epistaxis the initial rapid assessment and symptoms stabilization is necessary. Patients who have lost comparable rates of blood may have acute hypovolemia. This condition should be diagnosed and treated. The important points are family or personal history of prolonged bleeding, unusual bruising, medication containing aspirin, Coumadin, and non steroidal anti-inflammatory agents, liver disease, diabetes mellitus, cardiopulmonary disease and hypertension.

Then the careful and thorough examination of the nasal cavity must be done to detect the location of the bleeding and to assess any additional anomalies. Appropriate assessment and adequate use of vasoconstrictors and local anesthetics are necessary.

Some experts recommend surgery to take immediate control on severe epistaxis that theoretically because of peripheral blood the success probability is higher. In addition, lockjaw is a common complaint after the surgery that is secondary to trauma temporalis muscle (10, 11).

Mupirocin is an antibiotic that inhibits bacterial protein synthesis by binding to the isoleucine transferase enzyme. Two forms of this medicine are available in the market that its nasal form is ointment 2% in which eradication of nasal colonization with *Staphylococcus aureus* resistant to methicillin is used. In this way, it should be used twice a day for five days in each of the nasal cavities. Its topical application of 2% ointment is applied to the lesion and is used in the topical treatment of impetigo due to *Staphylococcus aureus*, *Streptococcus pyogenes* and hemolytic strep.

Contraindications of its use are extreme sensitivity to the drugs and renal dysfunction, so it should be used with caution. No drug interactions have been reported for this drug and its side effects are headache and rhinitis, nasal congestion, cough, nasal irritation, itching and erythema followed by its topical application.

Vitamin A is a fat-soluble vitamin that has several medicinal forms; Tablets (25,000) and capsules (50,000), for oral administration, injection (50000) for injecting and finally the eye ointment (250) for topical use.

Its eye ointment is used three times in each day to treat the abnormal dryness of the conjunctiva, superficial corneal ulceration and hemeralopia. This material is effective in Bone growth, testicular and ovarian function and growth regulation. The half-life is unknown and it is excreted through the feces. Contraindication of its use is hypervitaminosis.

Concurrent use of Cholestyramine and mineral oils reduces the absorption of vitamin and Concurrent use of oral contraceptive drugs may increase plasma levels of vitamin and in vitamin toxicity conditions, side effects (headache, irritability, hair loss, anorexia, and skin discoloration) occurs that is seen in systemic use (12).

In this study, it is assumed that the frequency occurrence of epistaxis in individuals who were treated with mupirocin is less than patients with Vitamin A treatment.

The aim of this study is the determination of the effect of mupirocin compared with non-organic vitamin A in children in Zahedan in the spring and summer of 2010 and the comparison of their distribution with non-organic epistaxis in two treatment groups.

### **Literature Review**

In a study in 2004 by Dr Tibbelin et al. in Gothenburg Sweden in patients who were referred to the hospital with bleeding, hemostatic effect of topical Tranexamic gel and placebo was examined. Their patients were selected randomly. The patients treatment duration began from the first bleeding day until 10 days later (i.e. full recovery) and the results showed no significant differences in the two groups and it was found that Tranexamic acid is not superior to placebo in the treatment of nose bleeds but the gel seems to be useful because its use is easy and without side effect (5).

In another study conducted on 80 patients by Alderson et al in 2002 in America, The patients was divided into two groups. Estrogen was administered to a group and the second group received placebo and the drug was discontinued after 4 weeks of treatment and then the patients were followed up for 4 weeks. The results of epistaxis in the estrogen-treated group were 4% and in the control group was 36%. This suggests that estrogen has the relative effectiveness in the control of epistaxis (6).

In a study conducted on 103 children in the age range of 3 to 13 years by Kubba et al in Glasgow, Scotland in 2001, the results showed that the antiseptic cream is effective as cautery but it is not clear which one is better. Research undertaken by a prospective blinded and randomized in the Otorhinolaryngology clinic

at Children's Hospital Glasgow. Selected patients were 78 patients who were referred because of recurrent epistaxis. Cases that were excluded from the study included suspected tumor, coagulopathy disorders, and allergies, respectively. Patients were divided into two groups of control and treatment and the treatment was the antibiotic cream that were consumed twice time daily for four weeks and all children were under observation and cared up to eight weeks after entering the study.

The results show that in the treatment group, 55% of patients had no problem in four weeks and in the other group, 29% did not have any problems. In the rest, 47% patients had a partial response and 26% were treated completely and 3.8% patients need to tailor further treatment. This information only included 855 people. Overall, the authors concluded that anti-septic cream is an effective treatment for recurrent epistaxis in children (7).

## MATERIALS AND METHODS

The study was a clinical trial. The study subjects were children in the age range of 3 to 15. The study was conducted in private practice and Otorhinolaryngology clinic of Khatamolanbia hospital in Zahedan in the spring and summer of 2010.

The absence of abnormalities underlying cause of epistaxis such as hematologic diseases, medications, high blood pressure 80/130 was checked by performing the necessary tests, including PTT, PT, CBC and blood pressure measurements. The inclusion criteria for this study were those who had more than once bleeding, and the other causes such deviated septum, allergies of nasal prominent vessels and chronic sinusitis.

Lack of consent of patient at any time of the study, sensitivity to medication and bleeding requiring aggressive therapy were exclusion criteria.

Sampling method was census and sample size was calculated using the following formula:

$$\frac{(Z1 - \alpha/2 + Z1 - \beta)^2 (S1^2 + S2^2)}{(X1 - X2)^2}$$

$\alpha$  and  $\beta$  in the confidence coefficient of 95%

$S1=6(4)$

$X1=10.066(4)$

$X2=5.394(4)$

$N=36$

72 patients younger than 15 years and up to 3 years of Khatamolanbia hospital in Zahedan with epistaxis problems were equally divided into two groups of A and B. For data collection, a questionnaire was designed and after consent of patient to participate in the study, some data were recorded to rule out organic causes.

Individuals were divided into two groups by blocked randomized method. The first group, after initial control of bleeding, takes Mupirocin ointment twice a day and the second group received a topical ocular vitamin A twice a day. Patients were treated with drugs for 4 weeks and the patient was advised to visit clinic in case of problems or bleeding during the treatment. After a treatment period of 4 weeks at the end of each week the number of episodes of epistaxis were recorded bleeding into three groups or more than three times daily, weekly, monthly or full recovery groups.

After data collection, differences in the frequency of bleeding in the both drugs with t-test for two independent samples were used and for statistical data analysis, SPSS software (version 17) was used.

After a thorough explanation of the treatment, the parents of the patient or their patient were justified to perform this treatment.

## RESULTS

Among the 72 patients, 36 patients (50%) aged 3 to 7 years and 20 patients (27.7%) were in the age range of 7 to 11 years and 16 (22.2%) persons were in the age range 11 to 15 years. In total, 55% of patients were male and 45% of patients were female.

In the group treated with vitamin A in 20 patients (55.55%) who had daily bleeding, 6 patients still complained of daily bloodshed and 12 people have this problem only once a week and 2 persons have bleeding once a month.

Among 10 patients (27.77%) who had weekly bleeding, 6 of them have the same state, but for the four others it was repeated monthly.

Among the 6 patients (16.66%) of the monthly epistaxis, change in the frequency of bleeding, was not observed. In total, daily bloodshed in 6 patients (11.11%) was like wise daily and for 18 persons (44.44%) and 12 persons (44.44%) were converted weekly and monthly respectively.

In the group treated with mupirocin, among 18 patients (50%) who had daily bleeding, change in the frequency of bleeding, was not observed in 4 people and for 12 persons and 2 persons, it converted weekly and monthly respectively. In 6 patients with monthly epistaxis the change was not observed and in total with treatment of this group, 4 patients (11.11%) had daily bleeding and 16 (44.44%) had Weekly and 16 persons (44.44%) had monthly bleeding.

Although the two groups before the study have not significantly different  $p_v=0.85$  but in the end, reduction in the amount of bleeding during treatment with vitamin A was significant at  $p_v=0.004$  and also reduction in the amount of bleeding during treatment with mupirocin was significant at  $p_v<0.001$  and the reduction in blood loss between the two drugs was not significant  $p_v=0.478$ .

Table 1: The number of epistaxis occurrence before treatment with Vitamin A

	Daily	Weekly	Monthly
Vitamin A	20	10	6
Percent	55.55	27.77	16.66

Table 2: the number of epistaxis occurrence before treatment with mupirocin

	Daily	Weekly	Monthly
Mupirocin	18	12	6
Percent	50	33.33	16.66

Table 3: the number of epistaxis occurrence after treatment with Vitamin A

	Daily	Weekly	Monthly
Vitamin A	6	18	12
Percent	16.66	50	33.33

Table 4: the number of epistaxis occurrence after treatment with mupirocin

	Daily	Weekly	Monthly
Mupirocin	4	16	16
Percent	11.11	44.44	44.44

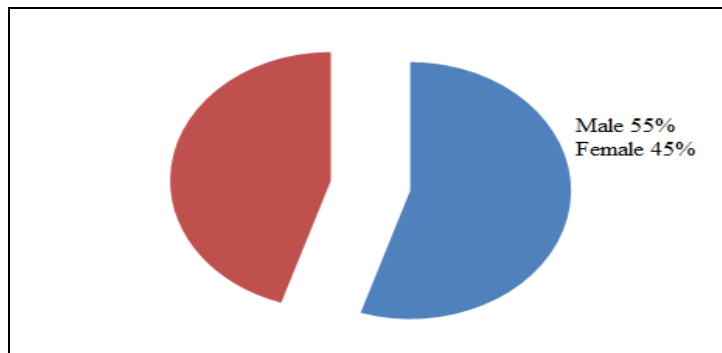


Figure 1 sex distribution among the subjects

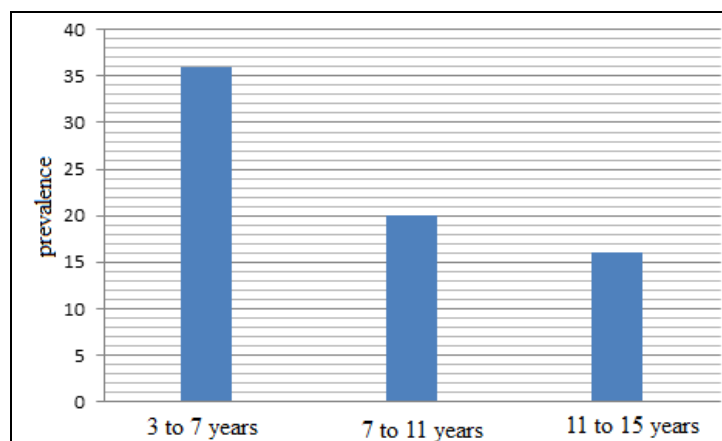


Figure 2 Age distribution diagram of participants

The age range of 3 to 7 years, 36 patients  
The age range of 7 to 11 years, 20 patients  
The age range of 11 to 15 years, 16 patients

## RESULT AND DISCUSSION

Epistaxis in children is quite different from the adult and posterior epistaxis, anticoagulants, are blood pressure disorders are less seen in them. While Crust in children causes repeated bleeding and this study was only done in the community of children 3 to 15 years. As we know, stunning and calming children to control epistaxis in hospital is very difficult but the use of antibiotic creams is quite easy and safe and in a study conducted by the Dr. Tibbelinthis claim has been proven. It seems that the epistaxis control, which was followed by four weeks, mupirocin has been effective.

In this study, the children are divided into groups randomly and each group was administered with one of our presumed drug for treatment. Since re-visit for patients during therapy did not done except in special cases (complications, uncontrolled bleeding),another problems were been solved over the phone and follow up of these patients and the difference between the effects of the two drugs were administered in the end. But due to time constraints, it failed to prove each of them to full recovery.

Although there was a difference in gender distribution between the two groups under study but since there was no difference in improvement of male and female so we conclude that gender does not affect the rate of recovery.

According to the results, each of the two drugs separately were effective in reducing the frequency of bleeding inorganic children and especially in tracking daily and weekly groups bleeding positive effects of drugs was tangible and the reason that they were ineffective in monthly bleeding can be attributed to the short-term of study.

Although the comparison between the two drugs was not significant but much less pvin the mupirocin demonstrated the effectiveness of this drug is greater than vitamin A. Perhaps the insignificance of comparison can be attributed to major bleeding reason in children so that both drugs have been given based on their lubricating effect prevent from new crust formation after air dryness and heat. The result is consistent with the results of Anders about effect of Tranexamic Acid gel.

It is noteworthy that any patient's complete remission was not reported during the study. The reason can be attributed to the cultural level of the family, repeated trauma to the nose by children through the nose manipulating, and the hot and dry and dusty weather in this area.

Despite the small number of children, the short-term effects of these drugs were shown. Therefore, it can be used in patients as a temporary treatment and studies to evaluate the effects of these drugs in long-term and to answer the question of how can these findings be used to successfully patients treatment, the more studies are recommended.

## REFERENCES

1. Paul M Middleton. (2004). Epistaxis. Emergency Medicine Australasia - EMERG MED AUSTRALAS. 2004;16(5-6):428-440.
2. Kubba H, MacAndie C, Botma M, Robison J, O'Donnell M, Robertson G, Geddes N.A (2001). Prospective, single-blind, randomized controlled trial of antiseptic cream for recurrent epistaxis in childhood.Clin Otolaryngol Allied Sci.;26(6):465-8.
3. HerknerH, Havel C, Müllner M, Gamper G, Bur A, Temmel AF, Laggner AN, Hirschl MM. (2002). Active epistaxis at ED presentation is associated with arterial hypertension. Am J Emerg Med. ;20(2):92-5.
4. Damrose JF, Maddalozzo J. (2006). Pediatric epistaxis.Laryngoscope.;116(3):387-93.
5. Tibbelin A, Aust R, Bende M, Holgersson M, Petruson B, Rundcrantz H, Alander U. (1995). Effect of local tranexamic acid gel in the treatment of epistaxis. ORL J Otorhinolaryngol Relat Spec. 1995;57(4):207-9.
6. Pothula V, Alderson D. (1998). Nothing new under the sun: the management of epistaxis.J Laryngol Otol. Apr;112(4):331-4.
7. Allen M. Seiden. (2006). Otolaryngology: The Essentials. 137-170.
8. Naclerio RM. (1991). Allergic rhinitis.N Engl J Med. ;325(12):860-9.
9. Graham JM, Scadding GK, Bull PD (Eds.). (2007). Pediatric ENT. 1st ed. Springer.
10. Rudolf Probst, Gerhard Grevers, Heinrich Iro. (2005). Basic Otorhinolaryngology: A Step-by-Step Learning Guide. 1st edition. Thieme.
11. Paul W. Flint. (2005). Cummings Otolaryngology Head & Neck Surgery. 4th edition. Elsevier. 2005.
12. Trevor AJ, Katzung BG, Kruidering-Hall MM, Masters SB. Katzung & Trevor's Pharmacology: (2008). Examination & Board Review. 8th edition. LANGE Basic Science.

## CITATION OF THIS ARTICLE

Gholamali D K and Aghil A. The Investigation of the Mupirocin effect on Epistaxis treatment in Comparison with non-organic treatment with Vitamin A in children of Zahedan city in the Spring and Summer of 2010. Bull. Env. Pharmacol. Life Sci., Vol 3 [12] November 2014: 134-138