

Oxymetazoline in the Treatment of Posterior Epistaxis

Gene Doo MD and David S. Johnson MSIV

Abstract

In this retrospective study, 36 patients were given oxymetazoline as a first step in treatment for posterior epistaxis. In 75% of the cases, epistaxis was effectively treated with oxymetazoline with no recurrent bleeding. All cases with recurrence resolved with continued administration of oxymetazoline. The results of this study propose a pharmacologic intervention for the treatment of posterior epistaxis.

Introduction

Epidemiology

About 60% of the western population will experience at least one episode of epistaxis during their lifetime.¹ According to Josephson,² 15 per 10,000 persons require attention by a physician for epistaxis annually, and of the 15, 1.6 persons will require hospitalization.

The cause of epistaxis is often obscure, and the patient often is unable to recall the precipitating factor. However, desiccation from dry air with resulting mucosal wall cracking, nose picking, or hard nose blowing are the most common causes of anterior nose bleeds, whereas systemic disease almost always manifest themselves as posterior bleeds.³ Table 1 lists local and systemic causes of epistaxis.

Table 1.— Etiology of Epistaxis

Local	Systemic
Nasal or facial trauma	Atherosclerosis of nasal blood vessels
Upper respiratory tract infections	Hypertension
Nose picking	Diabetes Mellitus
Allergies	Anticoagulant therapy
Low home humidity	Abrupt changes in barometric pressure
Nasal polyps	Pregnancy
Foreign body	Chemotherapy
Environmental irritants	Blood dyscrasias
Nasopharyngeal neoplasm	Hereditary hemorrhagic telangiectasis
Traumatic internal carotid aneurysm	Folic acid deficiency
Postoperative bleed	Alcoholism
	Chronic nephritis
	Migraine headache
	Acute febrile illness

Sites of bleeding

Anterior epistaxis almost always originates from Kiesselbach's plexus, but can also occur from the branches of the sphenopalatine artery. It is more common in persons under 40 years of age, and usually a result from trauma.¹

Posterior epistaxis originates most commonly from the sphenopalatine artery as it emerges from behind the inferior and middle turbinates. It accounts for 5-10% of all cases of epistaxis and is more common in persons over 40 years of age.¹ Posterior epistaxis is usually associated with systemic disease.

Treatment

Pinching the nose for 10-15 minutes locally controls anterior epistaxis. For recalcitrant bleeding, suctioning, with silver nitrate cauterization is performed. For posterior epistaxis, it is difficult to visually locate the site of hemorrhage due to the anatomy of the posterior part of the nose and because posterior nosebleeds are usually profuse. Local packing has therefore been the traditional approach to control hemorrhage. Cut-down tampons, inflated trimmed Foley catheters, nasal tampon balloons, or Merocel have been utilized. The disadvantage of posterior packing is that they require hospital admission for observation of possible complications (Table 2.). Other methods of treatment include electrocautery, ligation surgery, arterial embolization and cryotherapy.

Table 2.— Complications of Local Posterior Packing

Hypoxemia
Sepsis
Esophageal perforation
Hemotympanum
Middle ear effusion
Acute otitis media
Acute sinusitis
Ruptured tampon balloon with aspiration of saline
Necrosis of mucous membranes
Pressure necrosis of skin

Oxymetazoline Hydrochloride

Oxymetazoline is a topical decongestant, which acts as a local vasoconstrictor of intermediate duration. We believe that the vasoconstrictive effects of oxymetazoline can be applied to arresting nosebleeds. Krempl and Noorily demonstrated that the use of oxymetazoline alone was sufficient to control 65% of cases of both anterior and posterior epistaxis presented to an emergency center [4]. In addition to the ease of administration, other factors which make oxymetazoline attractive are cost (average cost less than \$5.00), avoidance of hospitalization, and avoidance of uncomfortable procedures for the patient.

Correspondence to:
Gene W. Doo MD
Suite 1007
The Queen's Physicians Office bldg
1380 Lusitana Street
Honolulu, HI 96813

Materials and Methods

In this study, 532 cases of epistaxis were reviewed from the office of an Otolaryngology specialist from January 1, 1991 to August 30, 1996. Only adults with active posterior nosebleeds were included in the study. Cases with mild epistaxis due to allergies or sinusitis were not included in the study as these patients were treated with corticosteroid inhalers, antihistamines, and/or antibiotics. Data regarding age, sex, etiology, risk factors, treatment, follow up, and hospitalization were collected. Recurrence of epistaxis was recorded if there was any evidence of active bleeding, which included trace amounts within 6 months.

Four to six sprays of oxymetazoline in each nostril were given as a first step in treatment. Patients were then instructed to remain in a sitting position and rest quietly. Patients were observed for one to two hours, and readministration of oxymetazoline was done if bleeding persisted. After severe bleeding stopped, the patients were sent home and instructed to continue oxymetazoline administration at a dose of two sprays in affected side every 6 hours until returning for follow up assessment within one to three days.

Results (Tables 3 and 4)

Of the 532 cases reviewed, 36 patients were selected for this retrospective study. All data regarding gender, age, risk factors and etiology is presented in table 3. There was a good distribution among men and women, 17 verses 19 respectively. Average age for patients with posterior epistaxis was essentially the same for both men and women (64 yrs for male, and 62 yrs for females.)

Of the risk factors included in the study, hypertension was present in most patients (13; 36%), followed by acetylsalicylic acid use (6; 17%), diabetes mellitus (5; 14%), coumadin use (3; 8%), thrombocytopenia (2; 6%), and radiation therapy (2; 6%).

Twenty-eight patients (78%) did not have a causal history for epistaxis. Trauma accounted for 4 cases (11%), and the remaining etiologies accounted for one case each. One case of sinusitis was included, because epistaxis was profuse, and was subsequently treated with oxymetazoline.

Oxymetazoline was administered in all cases. Eight cases had additional gel foam placement, not to be used as packing, but to provide topical application of oxymetazoline. Recurrence occurred in 9 patients (25%). Three patients were admitted to the hospital, 2 for blood transfusions, while the other was admitted due to his preexisting history of congestive heart failure, atrial fibrillation and hypertension in addition to blood loss. In all three admissions, oxymetazoline was continued without posterior packing. In all cases, bleeding eventually stopped. All other cases of recurrent epistaxis were mild bleeds, which eventually ceased after continued oxymetazoline use.

The influence that risk factors had on outcome is depicted in table 4. Of the 21 cases with a history of epistaxis, 6 (29%) had recurrence, whereas only 3 of the 15 cases (20%) with no history of epistaxis had recurrent nosebleed. Of the 13 cases with a history of hypertension, 7 (54%) had recurrence, whereas only 2 of 23 cases (9%) with no history of hypertension had recurrence. Three of 5 cases (60%) with a history of diabetes had recurrence, while only 6 of 31 cases (19%) of non-diabetics did. Of the 6 cases with a history of acetylsalicylic acid use, 2 (33%) had recurrence, while 7 of 30 cases (23%) with no acetylsalicylic acid use had recurrence.

Table 3.— Results

	Patients (n)	% Patients
Male	17	47
Female	19	53
Age		
20-39	5	14
40-59	11	31
≥60	20	56
Risk Factors		
ASA	6	17
Coumadin	3	8
Hypertension	13	36
Diabetes Mellitus	5	14
Thrombocytopenia	2	6
Radiation Treatment	2	6
Etiology		
Unknown	28	78
Trauma	4	11
Polyps	1	3
Infection	1	3
Sinusitis	1	3
Pregnancy	1	3
Efficacy		
No Recurrent Bleeding	27	75
Recurrent Bleeding	9	25

Table 4.— Influence of Risk Factors on Recurrence

Risk Factor	Patients (n)	Recurrence (%)
Epistaxis		
Yes	21	(6/21) 29%
No	15	(3/15) 20%
Hypertension		
Yes	13	(7/13) 54%
No	23	(2/23) 9%
Diabetes Mellitus		
Yes	5	(3/5) 60%
No	31	(6/31) 19%
ASA use		
Yes	6	(2/6) 33%
No	30	(7/30) 23%

Discussion

In this study, 8.5% of epistaxis cases were of posterior origin. Though lower than the estimated occurrence of 10% reported by Perretta,⁵ some of the discrepancy can be accounted for by the fact that mild nosebleeds associated with chronic sinusitis and allergies were not included. In 78% of the cases, there was no causal history for epistaxis. This is consistent with Petruson who found that in the majority of cases, the cause was unknown.

Hypertension is a major risk factor for posterior epistaxis.⁵⁻⁷ In this study, 36% of the total cases have a positive history of hypertension, and of this subgroup, 54% had recurrence. Of the nine cases with recurrent bleed, 7 had hypertension and 3 were diabetics. It is

possible that pathological structural changes within the arteriole wall associated with hypertension and diabetes may result in reduction of the blood vessels' ability to change diameter in response to oxymetazoline administration. Nonetheless, care should be taken with oxymetazoline therapy in this population as it may be contraindicated due to its sympathomimetic property. Six of 21 cases with a positive history of previous epistaxis had recurrence, which may suggest that oxymetazoline is not as effective in patients with recurrent epistaxis. However, it more likely re-establishes the fact that posterior epistaxis is mostly secondary to underlying systemic disease, that will continue until that underlying cause is addressed. In all cases with recurrent epistaxis, oxymetazoline was continued, and all nosebleeds did eventually cease. There is the possibility that the epistaxis could have spontaneously stopped independent of treatment. This study falls short of not having a prospective randomized placebo controlled study. Therefore, further investigations using large randomized controlled trials are necessary.

Oxymetazoline offers a cost-effective method of treatment. Due to the necessity of monitoring patients following posterior packing, or the need for surgery, the majority of patients with posterior epistaxis will be admitted to the hospital. Duration of inpatient care

can range from 1 to 36 days, with a mean stay of 5.5 days.³ Cost can range from \$1,000 to over \$20,000.⁸ In sharp contrast, posterior epistaxis can be treated on an outpatient basis with oxymetazoline at cost of less than \$5.00 per 15 ml, and spares the patient from the discomfort associated with posterior packing. In addition to its low cost, it is also easily administered and therefore an attractive first-line therapy for posterior epistaxis.

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