

## Epidemiology of Epistaxis in a Canadian Emergency Department

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### Abstract

**Objectives:** To assess the epidemiology of epistaxis in an Emergency Department (ED) of a large Canadian tertiary care center.

**Methods:** The study group consisted of all patients with a primary diagnosis of epistaxis who presented from September 1, 2005 to August 31, 2006 at the ED of the Queen Elizabeth II Health Sciences Centre. Background and clinical data were collected from the medical charts. Special attention was addressed to the role of medication in the development of epistaxis.

**Results:** A total of 222 charts were reviewed. Mean patient age was 65.9 years. Atraumatic injuries accounted for 73.4% of cases and traumatic injuries for 10.8%. Current anticoagulant therapy was documented in 40.5 % of patients and preexisting hypertension in 43.7%. An otolaryngologist was consulted in 16.6% of cases, and 11.7% of patients were hospitalized. In 23.8% of cases, the patient had visited the ED at least once before for epistaxis.

**Conclusions:** Epistaxis can usually be managed successfully in the ED. Most events are due to atraumatic injury. High rates of affected patients are under treatment with anticoagulant agents or have hypertension or both. Increased patient education on the control and prevention of epistaxis might reduce the rate of repeated visits.

**MeSH Words:** Epistaxis, emergency department

### Introduction

Epistaxis is a fairly common medical problem in the Emergency Department (ED). Roughly 60% of the population will experience at least one episode of epistaxis in their lifetime, among which 6% will seek medical attention [1]. However, the epidemiology of epistaxis in the ED has hardly been addressed in the literature.

The causes of epistaxis can be classified into traumatic and atraumatic injury. Traumatic epistaxis is more common in younger individuals (under age 35 years) and is most often due to nose picking, facial injury, or a foreign body in the nasal cavity [2,3]. Atraumatic epistaxis is more characteristic of older patients (over age 50 years) and may be due to exposure to drugs

(nasal sprays, anticoagulants, antiplatelet agents), organ failure, neoplasia, inflammation, or environmental factors (temperature, humidity, altitude) [2,3]. Epistaxis poses a greater risk in elderly people in whom clinical deterioration may progress rapidly if the blood loss is significant.

Blood vessels in the nose run superficially through the easily-damaged mucosa and are therefore relatively unprotected. Anterior epistaxis is far more common than posterior epistaxis, accounting for 80% of cases [1]. Anterior nosebleeds arise from damage to Kiesselbach's plexus on the lower portion of the anterior nasal septum, whereas posterior nosebleeds arise from damage to the posterior nasal septal artery [2].

Nasal packing is often used to treat anterior nosebleeds. Many centers use Merocel sponges formed of compressed foam which expand inside the nasal cavity [2]. The treatment of posterior epistaxis is more complicated, requiring balloon insertion or a formal posterior pack. Brighton balloons, designed specifically for the management of epistaxis, consist of two independently inflated balloons [2]. Formal posterior packing involves inserting a gauze pad sutured to a catheter into the nose and placing it within the nasopharynx [2]. Electrocautery may be required for severe bleeding [4].

There are at present no Canadian studies of epistaxis in the ED. The aim of the present study was to provide an epidemiological analysis of epistaxis in the ED of a large tertiary care center.

### Methods

The Queen Elizabeth II Health Science Centre (QEII HSC) provides care to adults (age 16 years and over) residing in the city of Halifax and also serves as a referral center for the province of Nova Scotia. For the present study, we searched the database of the hospital's ED Information System for all patients with a primary diagnosis of epistaxis who presented between September 1, 2005 and August 31, 2006. The chart of each patient was reviewed using the Horizon Patient Folder (HPF) imaging system. The primary outcomes for the study were number of ED visits for epistaxis, types of injury, presence of hypertension and medications being taken by patients at the time of occurrence. Secondary outcomes were season in which the nosebleed occurred and referral to an ear, nose and throat (ENT) specialist and/or admission to hospital.

This study protocol was approved by the QEII HSC Ethics Board.

### Results

Between September 1, 2005 and August 31, 2006, 281 patients presented to the ED of the QEII HSC with epistaxis. The charts for 222 patients were available for evaluation on HPF, and these formed the study group. Average patient age was 65.9 years. Ninety patients (40.5%) were receiving at least one anticoagulant drug at the time of the event. The average age of this subgroup was 75.5 years compared to 56.3

years for the subgroup of patients who were not receiving anticoagulant therapy (Table 1). The most common anticoagulant drug being used was acetylsalicylic acid (ASA) (20.3%), followed by warfarin (11.3%). Fifty-three patients (23.8% of the sample) had attended the ED on multiple occasions for epistaxis: 49.1% of this subgroup was receiving anticoagulant therapy, and 63.04% were more than 65 years old. The under-50-year age group and the 50-64-year age group each accounted for 21.7% of the subgroup of patients with repeated visits.

Epistaxis was due to atraumatic injury in 73.4% of patients and traumatic injury in 10.8%. Within the atraumatic epistaxis subgroup, 42.9% of patients were taking at least one anticoagulant medication (Fig. 1). The corresponding rate for major traumatic epistaxis was 36.8% (Fig. 1). A similar trend was noted for minor traumatic epistaxis (due to nose picking).

A history of hypertension was noted in 43.7% of patients, of whom 40.5% were receiving antihypertensive medications. Atraumatic epistaxis was documented in 79.4% of the patients with known hypertension and in 86.6% of the patients being medically treated for hypertension (Fig. 2).

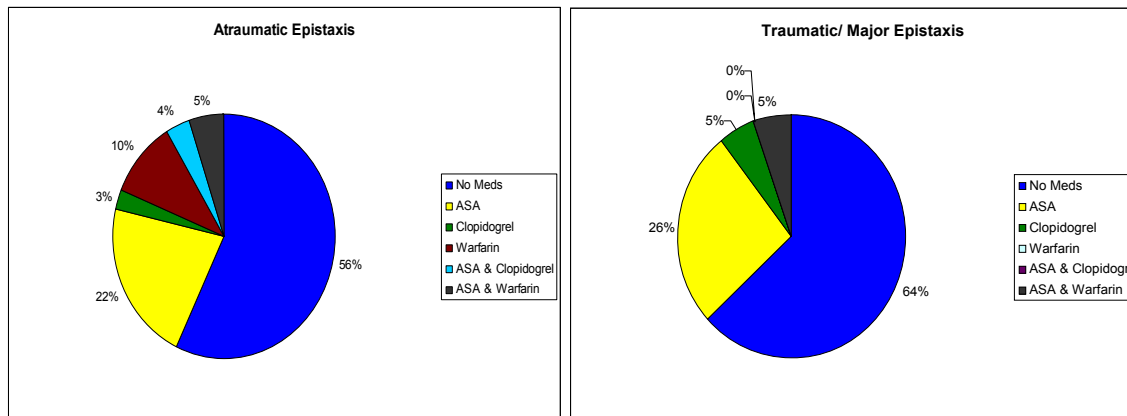
Only 11.7% of all patients presenting with epistaxis required hospitalization; half of them were currently taking anticoagulant drugs (Fig. 3). There was no difference in hospitalization rate between patients taking ASA or warfarin. Most of the hospitalized patients (84.6%) were admitted to the otolaryngology (ENT) ward, and the remainder were admitted to departments/divisions of plastic surgery, oral/maxillofacial surgery, or palliative care. Only 4.1% of patients were sent home with a referral to an ENT clinic for follow-up.

An otolaryngologist was consulted for 16.6% of the patients. Of these, 59.5% were referred by the emergency room physician and 40.5% were sent to the ED either by another hospital or their family doctor for direct consultation with an ENT specialist. More than half the patients (51.4%) that required an ENT consult were receiving at least one anticoagulant drug (Fig. 4). Of the patients seen by an otolaryngologist, 59.5% were admitted to the ENT ward, 10.8% were admitted to another service, and 27% were sent home.

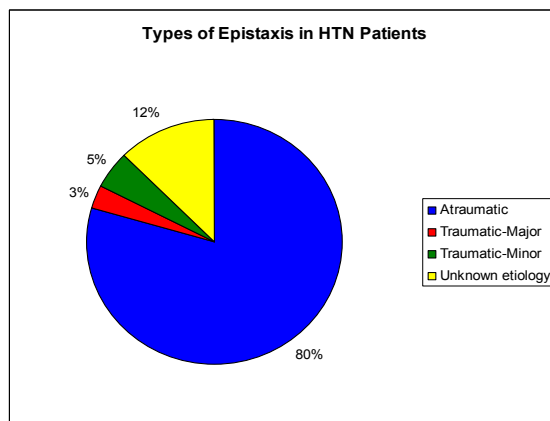
**Table 1.** Background data of patients presenting with epistaxis, by anticoagulant treatment

Demographic features	No meds	*ASA	Clopidogrel	Warfarin	ASA & clopidogrel	ASA & warfarin
Average age	56.3 yr	67.6 yr	78.8 yr	79 yr	76.3 yr	75.8 yr
Male sex (n=113)	61.1%	24.7%	0	9.7%	2.7%	1.8%
Female sex (n=109)	57.8%	15.6%	4.6%	12.8%	2.8%	6.4%

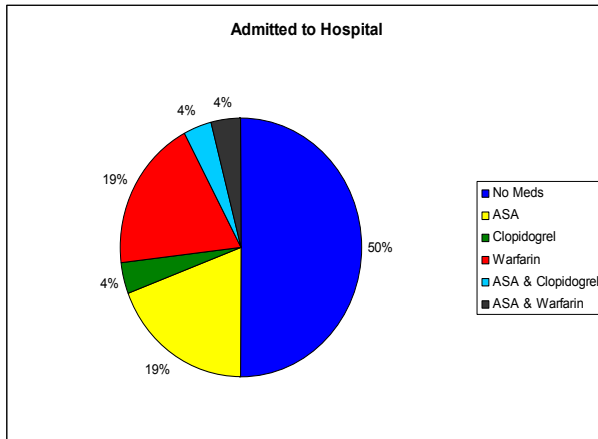
\*ASA, acetylsalicylic acid



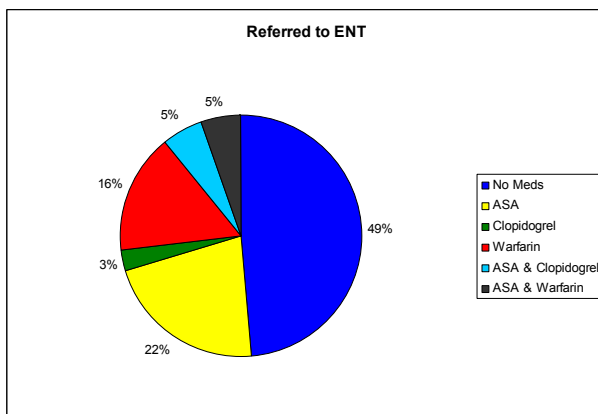
**Figure 1.** Distribution of anticoagulant drug use among patients with atraumatic and traumatic epistaxis.



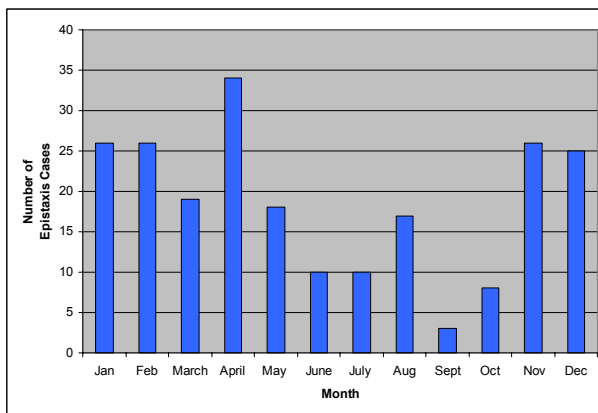
**Figure 2.** Distribution of causes of epistaxis among patients with known hypertension.



**Figure 3.** Distribution of anticoagulant drug use among patients hospitalized for epistaxis.



**Figure 4.** Distribution of anticoagulant use among patients referred to an ENT specialist.



**Figure 5.** Seasonal distribution of epistaxis episodes.

We also stratified the rates of epistaxis by season of presentation (Fig. 5). During the winter months (Nov-Feb), 103 patients presented to ED with epistaxis, compared to 55 patients during the summer months (May-Aug).

## Discussion

The epidemiology of epistaxis in Canadian EDs is almost completely unknown. The present one-year study investigated 222 patients who presented to the ED of the QEII HSC, a large adult tertiary care medical center in Canada, with a main complaint of epistaxis. The majority of patients, who were older than 60 years, sustained atraumatic (as opposed to traumatic) epistaxis and did not require referral to a specialist or hospitalization. These findings indicate that emergency medicine physicians play an important role in first-line management of epistaxis. Although the sample was relatively small, similar results were obtained in a much larger American study that evaluated the epidemiology of epistaxis in an ED over a 10-year period [3]. Those authors found that 83% of the patients had atraumatic epistaxis and that individuals more than 70 years old were at a sixfold higher risk of epistaxis than individuals less than 40 years old. The hospitalization rate was similar to ours. However, the earlier study did not investigate the possible role of medications in the development of epistaxis.

Anticoagulant therapy has been suggested to increase the risk of epistaxis. Two studies from the United Kingdom reported atraumatic epistaxis rates of 25% [5] and 42.9% [6] for patients being treated with anticoagulant therapy. In our study, about 20% of the patients on anticoagulant therapy were taking aspirin and about 11%, warfarin. The similar rates of hospitalization in these two subgroups suggests that warfarin is associated with a higher relative risk of severe epistaxis than ASA.

More than half the events of atraumatic epistaxis (57%) occurred in individuals not taking anticoagulants. Studies have shown that patients with inherited coagulopathies, including hemophilia, thrombocytopenia and von Willebrand's disease, are prone to intermittent epistaxis [7]. None of the patients in our series, however, was known to have an inherited coagulopathy, although the possibility of an unknown condition could not be excluded.

Nevertheless, given that our study was limited to adults and that earlier studies suggested that the majority of inherited coagulopathies are diagnosed prior to adulthood, we may assume that inherited coagulopathies played a minor role in the etiology of epistaxis (<5% according to Dizard et al. [7]).

The possible role of hypertension in the development of epistaxis is highlighted in this study. Patients with pre-existing hypertension accounted for 43.7% of our series, in line with rates reported in several other studies [7-9]. Further research is required to identify the mechanism underlying this association.

The effects of seasonal variations and ambient temperature on rates of epistaxis are still controversial. The increased rate of epistaxis during the winter months in the present study is supported by results obtained in an earlier American study [3]. This finding is explained by the greater dryness of the nasal mucosa in winter, making it more susceptible to damage and bleeding. Other studies, however, refute this theory [10,11].

In summary, the present study demonstrates that ED physicians play an important front-line role in the treatment of epistaxis. Therefore, a good understanding of the epidemiology and causes of epistaxis by emergency medicine physicians would help to ensure optimal patient care. To lower the high percentage of patients with repeated visits to the ED for a main complaint of epistaxis (23.8% in our series), we agree with earlier suggestions that patients be provided with printed handouts detailing basic preventive and first-aid measures for controlling epistaxis [2,3,5].

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