

Epistaxis and its relationship to handedness with use of intranasal steroid spray

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Abstract

Topical intranasal steroid spray is often used to treat allergic and nonallergic rhinitis, and epistaxis is a common side effect. The prospective, observational study described was designed to determine the incidence of epistaxis and the relationship between the side of bleeding and the hand used to administer the spray, as well as the handedness of the patient, in a noninvestigational, real-world setting. Of 559 consecutive patients using an intranasal steroid for more than 3 months, 28 patients (5%) reported epistaxis within the prior 2 months. Of the 32 reported sides of bleeding (unilateral and bilateral combined), 25 episodes (78%) were on the same side as the hand used to apply the spray. A strong correlation was found between the side of bleeding and both the hand used ($p < 0.001$) and the handedness of the patient ($p < 0.002$). Patient instruction on technique may reduce the incidence of epistaxis.

Introduction

Topical intranasal steroid (INS) sprays are commonly used and have been shown to be effective and safe for treating seasonal and perennial allergic rhinitis, nonallergic rhinitis, and nasal polyps.¹ They have also been used for other acute and chronic nasal conditions, including chronic rhinosinusitis,² acute rhinosinusitis, the common cold,³ and other inflammatory conditions

of the nose and sinuses. These agents have minimal side effects, and their good safety profile⁴ has resulted in approval of their use in small children.

Epistaxis is a common side effect of INS spray use. The incidence reported in clinical trials is usually about 5%, which is only 1 to 3% greater than the incidence reported with the use of placebo.⁴ The incidence appears to have decreased with the universal adoption of aqueous-based INS. Reports suggest that episodes of epistaxis are usually minor and self-limited. They may be the direct effect of the corticosteroid, preservative,⁵ pressure of the application, or technique used.⁴

Recent anecdotal findings suggest a correlation between the handedness of the patient and the side of bleeding. In a study published in 2004, approximately 80% of episodes occurred on the dominant-hand side,⁴ which was one factor prompting my colleagues and me to recommend that patients direct the spray away from the septum.⁴ The study was uncontrolled, nonprospective, and did not evaluate the incidence of epistaxis, however. No studies have evaluated a possible correlation between this incidence and the indications for use.

The present, prospective study was designed to evaluate the incidence of epistaxis with use of INS spray and the relationship between dominant-hand use and side of bleeding in a noninvestigational setting. Indications for use and frequency of epistaxis were also evaluated.

Study method

The study was approved by the Institutional Review Board of Henry Ford Hospital and Medical Group, and methods to ensure patient confidentiality were maintained. The study was performed in both a central-city academic site and a suburban private practice setting. Consecutive patients who were seen over the course of 1 year, had used INS spray for at least 3 consecutive months prior to presentation, and had not specifically

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been instructed by a healthcare provider to avoid spraying against the septum were enrolled.

Indications for use were determined for all patients. Because the study was observational, patients had confirmatory allergy testing only when it was part of their routine clinical care. A diagnosis of chronic rhinosinusitis was made on the basis of the criteria established by the Sinus and Allergy Health Partnership and endorsed by the American Academy of Otolaryngology–Head and Neck Surgery² and, subsequently, by five major otolaryngology and allergy societies.⁶

A diagnosis of allergic rhinitis was determined by a history of allergen-mediated nasal symptoms and, in a majority of patients, allergy confirmation with skin or in vitro testing. A diagnosis of nonallergic rhinitis was determined by the absence of medical history suggesting allergy and the presence of known environmental precipitants of nasal symptoms, with or without negative skin tests.

All patients were asked whether they had experienced epistaxis within the prior 2 months. The definition of epistaxis was left up to the patient, although a small amount of blood-streaked mucus on a single occasion of nose blowing was not considered to be epistaxis. Patients reporting one or more episodes of epistaxis were asked the side of bleeding, which hand they typically used to deliver the spray, and which hand was dominant. They underwent anterior nasal examination and/or nasal endoscopy, and possible sites of bleeding were identified if a small clot, an open sore, or prominent blood vessels were seen.

Formal statistical analysis was performed. Data consisted of matched pairs: the side where INS was sprayed with the hand on that side and the side where it was not. The epistaxis rate for each side was computed along with an exact 95% confidence interval (CI). The paired incidence rates were compared using the McNemar test. Significance was judged as $p < 0.05$. The same approach was used for the matched pairs defined by the dominant and nondominant hand.

Results

Of the 559 consecutive patients who met study criteria, 211 had chronic rhinosinusitis, 226 had allergic rhinitis, and 122 had nonallergic rhinitis. At least one episode of epistaxis was reported by 28 patients (5%): from one side only by 24 and from both sides by 4 (for a total of 32 sides). In 20 of the patients, evidence of a possible source of bleeding was found during the office visit. In every

case, the septum was the site of potential bleeding.

Of the 28 patients reporting epistaxis, 17 (61%) had chronic rhinosinusitis (13 of them with polyps and 10 with a history of surgical therapy), 6 (21%) had allergic rhinitis, and 5 (18%) had nonallergic rhinitis. Patients with chronic rhinosinusitis had a higher reported incidence of epistaxis (8%) than did patients with allergic rhinitis (3%) or nonallergic rhinitis (3.2%).

Of the 32 reported sides of epistaxis, 25 (78%) were on the same side as the hand used for spraying. The incidence rate of epistaxis on the same side as the hand used was 4.5% (25/559) (95% CI, 2.9 to 6.5), in contrast to an incidence rate of 1.3% (7/559) (0.5 to 2.6) on the other side. The two rates are significantly different ($p < 0.001$). In subjects with epistaxis on only one side, 86% (67.6 to 97.4) had it on the same side as the hand used to spray the INS.

Only one patient did not use the dominant hand to spray the INS. This right-handed subject used the left hand and experienced bleeding on the left. The incidence rate for epistaxis on the side of the dominant hand was 4.3% (24/559) (2.8 to 6.3), and the incidence rate on the nondominant side was 1.4% (8/559) (0.6 to 2.8). These rates differ at a value of $p < 0.002$. In subjects with epistaxis on only one side, 83% (62.6 to 95.3) had it on the same side as the dominant hand.

Discussion

The safety and efficacy of INS spray use is well documented.^{1,4,5} Reported side effects are few, but the one reported most often and seemingly of greatest concern to both patients and physicians is epistaxis. Typically, it is minor and self-limited, and in clinical trials its rate is not substantially higher than that occurring with placebo use.⁴

Some experts suggest that the risk of epistaxis is increased by spraying the INS directly at the septum, thus causing mechanical injury. The probability of such an occurrence could be expected to be increased on the same side as the hand used to apply the spray and reduced on the opposite side, where the spray is more likely to be angled toward the lateral nasal wall. Earlier observational assessments suggested these findings, but evaluation was poorly controlled.⁴

The current prospective study confirms that epistaxis is more likely to occur on the same side as the hand used to spray the INS. On the basis of current data, recommending that patients direct the spray toward the lateral aspect of the nose, and perhaps use the left hand

to spray the right nostril and the right hand to spray the left nostril, seems reasonable.⁴

In prospective clinical trials, the incidence of epistaxis with INS use has been approximately 5%,⁴ and this study suggests a comparable incidence in a real-world setting using similar criteria to define epistaxis.

Most prospective trials have evaluated patients with allergic rhinitis. In the present study, the incidence of epistaxis in these patients was 3%, which is lower than the rates typically seen in controlled trials. This difference is not substantial and might be attributable to the rigorous recording of adverse events in clinical trials, differences in definitions of epistaxis, or other factors related to trial methods. Patients in a real-world setting might ignore slight bleeding or believe it too insignificant to report. Also, it is possible that the rates of bleeding noted in clinical trials are greater than what is seen in clinical practice.

In a large survey study of U.S. households published in 2004, the incidence of epistaxis in the community was evaluated.⁷ Responses were elicited from 2,511 geographically and demographically representative households in March and from 2,027 different households in October. Minor recurring epistaxis in one or more household members (overall average, 1.4 members) was reported by 31% of the March group and 29% of the October group. If data were extrapolated to the entire U.S. population, it would translate to 45.1 million people experiencing epistaxis, or 15.8% of the population.⁷ The time frame in the survey study was not well defined, so comparing the general incidence of epistaxis to the incidence in INS users is difficult.

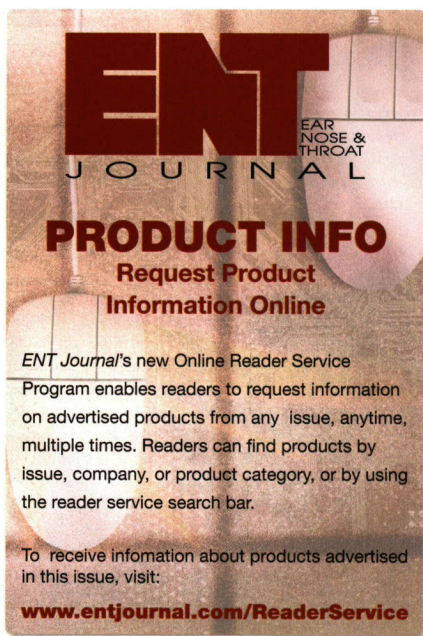
Results of the present study strongly suggest that the incidence of epistaxis in INS users is relatively small, even among those not specifically instructed on appropriate techniques. With patients instructed to direct the spray toward the lateral nasal wall and avoid the septum, the incidence would likely decrease, since potential bleeding sites were found on the septum only on physical examination. These findings may have implications for physician instructions to patients, clinical trials, and identification of proper technique in development, submission, and approval of new intranasal steroids.

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