

The Nose and its Relationship to the Eyes

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Baroody FM, Shenaq D, DeTineo M, et al.: **Fluticasone furoate nasal spray reduces the nasal-ocular reflex: a mechanism for the efficacy of topical steroids in controlling allergic eye symptoms.** *J Allergy Clin Immunol* 2009, **123**:1342–1348.

Chen CH, Lin YT, Wen CY, et al.: **Quantitative assessment of allergic shiners in children with allergic rhinitis.** *J Allergy Clin Immunol* 2009, **123**:665–671

Rating

- Of interest.

Introduction

The interplay between nasal inflammation and deleterious effects on the lungs has been well established and given the appellation *the nasal-bronchial reflex*. This review looks at two recent reports that examine the relationship between the nose and the region of the eyes. The use of nasal steroids in patients with allergic rhinitis is known to result in a reduction in ocular symptoms [1]. Prior studies have demonstrated that this does not seem to be secondary to a local steroid effect in the eye itself, as when topical steroids are insufflated in the nose, no significant amount has been shown to reach the eye [1].

Another consequence of allergic rhinitis is the allergic shiner. Marks first coined the term as early as 1954, noting the association between infraorbital edema and perennial allergic rhinitis [2]. It has been postulated that allergic rhinitis leads to allergic shiners as a result of nasal congestion increasing venous stasis with resultant infraorbital edema.

Aims

In the study by Baroody et al., the authors attempted to unravel the mechanism by which intranasal steroid therapy reduces ocular symptoms.

In the study by Chen and colleagues, the objective was to more precisely determine the association between infraorbital edema and allergic rhinitis and to determine which clinical aspects may intensify the shiners.

Methods

For the Baroody et al. study, following 2 weeks of washout from a screening nasal challenge with grass or ragweed (dependent upon allergen sensitivity), participants were started on placebo or fluticasone furoate nasal spray (110 µg) for 1 week. They then underwent a second nasal challenge for 3 consecutive days in an attempt to induce priming in a double-blind, placebo-controlled, crossover trial of 20 participants with seasonal allergic rhinitis. Individuals recorded their total nasal (running, sneezing, and stuffiness) and ocular symptoms (watering and itching) on each challenge day. Nasal eosinophils were also quantified via nasal scrapings taken before each challenge.

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For the Chen et al. study, using a novel computerized technique that measured digital photographs of allergic shiners, the Taiwanese researchers compared a group of children (6–12 years of age) with ($n=126$) and without ($n=123$) allergic rhinitis. In those with allergic rhinitis, daily symptom scores were measured, and rhinoconjunctival symptom scores were compared with changes in shiner size and darkness during monthly follow-ups.

Results

As expected, Baroody and colleagues found that treatment with nasal steroids reduced nasal symptoms ($P\leq 0.04$ on days 2 and 3) and the quantity of eosinophils within nasal secretions ($P\leq 0.05$ on all 3 days), but they also found a reduction in ocular symptoms compared with placebo ($P\leq 0.004$ on days 2 and 3).

The work of Chen et al. confirmed that shiners were much more common and prominent in children with allergic rhinitis compared with those without allergic rhinitis. The skin below the lower eyelid was significantly darker (52.2% increase; $P<0.001$), and the area of the shiners was significantly greater (111.7% increase; $P<0.001$) in the allergic rhinitis group compared with the control group. Interestingly, when examining factors that may impact upon this association, the authors did find a correlation between duration of allergic rhinitis and darkness of shiners ($P=0.02$), but they did not find a correlation between specific IgE, total IgE, or other associated atopic illnesses. Finally, among the participants with allergic rhinitis, they found that worsening eye symptom scores correlated with worsening shiners ($P=0.02$), as well as a linear correlation between severity of rhinitis symptom scores and darkness/size of shiners ($P=0.002$).

Discussion

Baroody et al. postulate that dampening of the nasal-ocular reflex may be the mechanism to explain how nasal steroids reduce ocular symptoms. Their belief is that the reduction in allergic inflammation, as manifest by diminution in nasal eosinophils, results in a decrease in neurologic reflex originating at the site of the challenge. This study also reinforces that not all ocular symptoms are the result of

direct allergen deposition on the conjunctiva. Although ocular symptoms as a whole decreased with nasal steroid treatment compared with placebo following nasal allergen challenge, there was little effect on ocular redness. The authors speculate that redness may be a sign of direct antigen stimulation that would not be responsive to the use of nasal steroids. Thus, further research is needed to determine if specific ocular findings may distinguish those who will respond to nasal steroids as monotherapy from those who require added therapy directed toward the eye.

Chen et al. found through their novel computerized technique that it is evident that allergic rhinitis does impact on shiner severity. Using this technique, it is hoped that we will better understand the mechanism of allergic shiner formation and the impact of medical intervention.

Comments

These two recent studies highlight that nasal inflammation adversely affects the region of the eyes. When one considers the findings by Baroody and colleagues, who demonstrated that treating the inflammatory component of allergic rhinitis resulted in improvement in ocular symptoms, one cannot help but wonder if there would also be improvement in allergic shiners. Using the novel technique described by Chen et al. would likely answer this question. Taken together, these studies reinforce our need to not underestimate the sequelae of uncontrolled allergic rhinitis, as not only the lungs, but also the region of the eye may be impacted.

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