



ROLE OF INTRANASAL CORTICOSTEROID IN ALLERGIC RHINOCONJUNCTIVITIS

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Devendra Sharma Assistant Professor, Department of Ophthalmology, Ananta Institute of Medical Sciences, Rajsamand, Rajasthan

Hemendra Bamaniya* Assistant Professor, Department of ENT, Ananta Institute of Medical Sciences, Rajsamand, Rajasthan *Corresponding Author

ABSTRACT

Objective: To assess the relationship between allergic rhinitis and allergic conjunctivitis and to assess the role of Intranasal corticosteroid in the management of Allergic rhinoconjunctivitis.

Material and methods: The study was done in Ananta Institute of medical Sciences, Rajsamand, Rajasthan from February 2016 to October 2017. A total of 100 patients with the diagnosis of allergic rhinitis or allergic conjunctivitis attended ENT or Ophthalmology outpatient department were included in our study. Type I allergy was tested by a specific IgE antibody test in the blood. iTNSS (instantaneous total nasal symptom score), iTOSS (instantaneous total ocular symptom score), rTNSS (reflective total nasal symptom score) and rTOSS (reflective total ocular symptom score) were noted before as well as after 1 week treatment with intranasal steroid spray Fluticasone Furoate (FF).

Results: A total of 100 patients were included in our study out of which 47 were male and 53 were female. Age of the patients ranges from 20 to 60 years with the mean age of 34.8 years.

79% cases included in present study were having symptoms of rhinoconjunctivitis; 13% cases were having only rhinitis symptoms and 8% were having only conjunctivitis symptoms.

The mean pre treatment iTNSS and iTOSS scores were 4.45 ± 2.70 and 2.35 ± 1.45 respectively, similarly, the mean post treatment iNSS and iTOSS were 2.36 ± 1.74 and 1.16 ± 1.43 respectively.

Conclusion: eye symptoms frequently occur in allergic rhinitis and the mechanism behind this can be explained by a neural mechanism i.e. nasal-ocular reflex. Intranasal steroid like Fluticasone Furoate with high topical potency and low potential for systemic effects is a good candidate for rhinitis treatment as well to manage ocular symptoms

KEYWORDS

Allergic rhinoconjunctivitis, intranasal steroid, Fluticasone Furoate

Introduction:

Rhinitis is defined as an inflammation of nasal mucosa and is characterized by itching of eyes/ears/nose/palate, sneezing, nasal congestion, clear rhinorrhoea, post nasal drip, facial pain, morning cough, headache, red watery eyes and/ or sleep disturbances.

When symptoms of rhinitis are triggered by an allergen, the resulting condition is referred to as allergic rhinitis. Allergic rhinitis may be seasonal, perennial, or may occur sporadically after specific exposures.

Eye symptoms frequently occur in patients with allergic rhinitis and are among the most bothersome symptoms so it is better to use term allergic rhinoconjunctivitis (AR) instead of using allergic rhinitis or allergic conjunctivitis separately for such symptoms.

In addition to the typical nasal and eye symptoms, AR leads to a significant impairment of the quality of life of its sufferers when measured by both generic and specific quality of life instruments (1, 2). Also associated with the disease are fatigue and daytime sleepiness, (1,3) reduced work productivity, (4-6) impaired cognitive functioning, (7, 8) reduced learning abilities, (9) and impaired sleep (10).

The pathophysiological mechanisms of the eye symptoms in allergic rhinoconjunctivitis include a direct effect on the eye by deposited allergen and indirect effects related to the deposition of allergen in the nasal mucosa. One of these proposed mechanisms is the existence of a nasal-ocular reflex whereby the nasal allergic reaction leads to an afferent reflex response, the efferent limb of which results in eye symptoms. Among the treatments available for allergic rhinitis, intranasal steroids are most efficacious for nasal symptoms and have also shown sizeable efficacy related to eye symptoms. It is helpful for diagnosing the allergic conjunctivitis and rhinitis to have a clearer understanding of the relationship between the two diseases. So the objective of the present study is to assess the relationship between allergic rhinitis and allergic conjunctivitis and to assess the role of intranasal corticosteroid in the management of Allergic rhinoconjunctivitis.

Material and Method:

The study was done in our tertiary care hospital from February 2016 to October 2017. A total of 100 patients with the diagnosis of allergic rhinitis or allergic conjunctivitis attended ENT or Ophthalmology outpatient department were included in our study.

All the patients were thoroughly examined, clinical history was taken and routine laboratory investigations were performed to rule out any co morbid disorders.

Allergic conjunctivitis was diagnosed as if the patient had characteristic symptoms and signs based on criteria set out by Buckley in 1998(11), and allergic rhinitis was diagnosed according to the criteria set out by allergic rhinitis impact on asthma (ARIA) in 2001(12).

Type I allergy was tested by a specific IgE antibody test in the blood. Eosinophils were detected in superficial conjunctival scrapings of the superior tarsal conjunctiva, and mucosal surface scrapings of middle meatus was taken in some severe cases (with permission of patient for the examination).

iTNSS (instantaneous total nasal symptom score), iTOSS (instantaneous total ocular symptom score), rTNSS (reflective total nasal symptom score) and rTOSS (reflective total ocular symptom score) were noted of all the patients. Fluticasone Furoate nasal spray was then advised to all the patients to administer two puffs twice a day. Post treatment scores were then calculated after one week of treatment with intranasal steroid.

Pre treatment and post treatment scores were compared to know about the efficacy of intranasal steroids in the treatment of allergic rhinoconjunctivitis.

Results:

A total of 100 patients were included in our study out of which 47 were male and 53 were female.

Age of the patients ranges from 20 to 60 years with the mean age of 34.8 years.

79% cases included in present study were having symptoms of

rhinoconjunctivitis; 13% cases were having only rhinitis symptoms and rest 8% were having only conjunctivitis symptoms.

The mean pre treatment iTNSS and iTOSS scores were 4.45 ± 2.70 and 2.35 ± 1.45 respectively, similarly, the mean post treatment iNSS and iTOSS were 2.36 ± 1.74 and 1.16 ± 1.43 respectively (Table. 1). The results showed significant reduction in nasal and ocular symptom after 1 week of treatment with intranasal steroid (p value < 0.05).

Table.1 The mean pre-treatment and post-treatment total nasal symptom score and total ocular symptom score.

Scores	Pre-treatment score	Post-treatment score
rTNSS	4.25 ± 2.45	2.45 ± 1.80
rTOSS	2.48 ± 1.56	1.26 ± 1.30
iTNSS	4.45 ± 2.70	2.36 ± 1.74
iTOSS	2.35 ± 1.45	1.16 ± 1.43

Boldface type indicates significance at a value of $p < 0.05$.
 rTNSS : reflective total nasal symptom score; iTNSS: instantaneous total nasal symptom score;
 rTOSS: reflective total ocular symptom score; iTOSS: instantaneous total ocular symptom score.

Discussion:

Allergic rhinoconjunctivitis is often used interchangeably with allergic rhinitis because ocular symptoms are usually present in allergic rhinitis. Studies have found a high incidence of watery/itchy eyes in allergic rhinoconjunctivitis (61–81%) (13, 14). Similarly in present study, 79% patients were having eye symptoms in allergic rhinoconjunctivitis.

There have been so many evidences and studies that support intra nasal steroids as a single-modality treatment for both nasal and ocular symptoms of allergic rhinoconjunctivitis (15, 16).

Consistent with previous studies, present study also indicated significant reduction in nasal and ocular symptoms after using fluticasone furoate nasal spray for 1 week.

The present study suggested that the beneficial effect of intra nasal steroids in reducing eye symptoms in allergic rhinoconjunctivitis is in support of existence of a nasal-ocular reflex.

However, several other mechanisms of this beneficial action have been proposed. By inhibiting local nasal inflammation i.e., production of cytokines and infiltration of inflammatory cells—intranasal steroids may have indirect systemic effects that reduce inflammation in other tissues, including the eyes (17).

Another possible explanation is that intranasal steroids may reduce inflammation of the nasolacrimal duct, thereby improving nasolacrimal drainage and reducing conjunctival exposure to allergens and inflammatory mediators (18). This hypothesis is undermined by the finding that nasolacrimal duct blockage does not increase the response to ocular antigen challenge, and by the Jones test, which shows continued patency of the nasolacrimal duct during allergic reactions in the nose (19).

It has also been suggested that intranasal steroids may travel through the nasolacrimal duct and thereby have direct anti-inflammatory effects on the conjunctiva. The lack of steroid related ocular side effects, such as glaucoma and cataract, indicates that movement through the nasolacrimal duct is not a viable mechanism for the ocular effects of intranasal steroids.

Although corticosteroids have potent systemic anti-inflammatory effects, systemic absorption of these agents after topical administration is below the level that would be expected to produce systemic effects, especially after the drug has been diluted by the blood before it can be delivered to the eye. The systemic bioavailability of fluticasone furoate after intranasal administration is less than 0.5%. Therefore, it is unlikely that intranasal steroids act systemically to relieve ocular symptoms, especially those caused within minutes of antigen challenge (18, 20).

Although our study investigated the effect of one of the available intranasal steroids, Fluticasone Furoate Nasal Spray, it is likely that the observed beneficial effect on eye symptoms in patients with allergic

rhinoconjunctivitis extends to other agents also within this class.

This is evidenced by several clinical studies using other intranasal steroids that demonstrate similar beneficial effects on eye symptoms (21, 22).

Conclusion:

Eye symptoms (itching, watery eyes, and redness) are an important part of the overall burden of allergic rhinoconjunctivitis and are associated with significant bother to allergy sufferers. These effects probably occur by several mechanisms, the most obvious of which, is the direct deposition of allergen in the conjunctiva and the generation of an ocular inflammatory response. Another mechanism that might contribute to the genesis of ocular symptoms in allergic individuals is a neural reflex generated in the nose upon exposure to allergen that results in an amplification of the allergic response to the other nostril and also to both eyes i.e. naso-nasal and nasal-ocular reflex. This mechanism might explain the efficacy of intranasally administered steroids in controlling ocular symptoms.

Fluticasone Furoate nasal spray is a new topical corticosteroid, with enhanced-affinity and a unique side-actuated delivery device, which is effective in improving nasal symptoms of AR. Significant improvement in ocular symptoms and in quality of life was also demonstrated. Its low oral bioavailability and high plasma protein binding minimize systemic adverse effects. A potentially prolonged nasal retention time may further enhance the efficacy of FF, which may allow for a once-daily dosing regimen in adults, adolescents, and children.

FF with high topical potency and low potential for systemic effects is a good candidate for rhinitis treatment. As expected for all new drugs, long-term safety and efficacy studies are required, which can establish the potential modification in allergic rhinoconjunctivitis management.

Conflict of interest:

No conflicts of interest exist for these authors. No relevant financial relationship exists between the authors and procedures or products used in this manuscript.

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