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Allergic Conjunctivitis in Allergic Rhinitis – Evaluation of Response to Intranasal Therapy

Medical Science

KEYWORDS :

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INTRODUCTION.

Allergic Rhinitis is an immunologic response of nasal mucosa which is IgE-mediated to air-borne allergens and is characterized by watery nasal discharge, nasal obstruction, sneezing and itching in the nose. Allergic rhinitis is triggered by allergens such as pollen, pet hair, dust, or mold. Inherited genetics and environmental exposures contribute to the development of allergies. The patho physiological mechanism involves IgE antibodies attaching to the allergen and causing the release of inflammatory chemicals such as histamine from mast cells. This histamine and other mediators of inflammation are responsible for the symptoms.

Allergic Conjunctivitis is inflammation of the conjunctiva due to allergy. Different allergens are involved in each individual but the most common cause is hay. Symptoms consist of redness of the eye, edema (swelling) of the conjunctiva, itching, and increased watering (lacrimation - production of tears). These symptoms are also due to release of mediators of inflammation from mast cell and this is also an IgE mediated immunological response.

Since the allergens of the two conditions are common, the two diseases are often seen to coexist and then are known as Rhino conjunctivitis. It is also to be noted that Allergic inflammation can occasionally occur without Allergic Rhinitis also, but mostly they occur together. Both conditions also exhibit similar patho physiological mechanisms. Pathways of communication are thought to increase the likelihood of an inflammatory reaction at both sites following allergen exposure of nasal or ocular tissue. (1)

AIMS AND OBJECTIVE SOF THE STUDY:

The study was conducted in Mayo Instute of Medical Sciences,Gadia Barabanki, over a period of 10 months, Institutional Ethics committee approval and the patients written, informed and valid consent were obtained. The study is based on finding the incidence and pattern of allergic conjunctivitis in patients suffering from allergic rhinitis and the response in ocular symptoms after treatment of Allergic Rhinitis. The study also tries to find out whether active ocular treatment is needed or not for allergic conjunctivitis in cases of allergic rhinitis, or the treatment of allergic Rhinitis alleviates the symptoms of allergic conjunctivitis also. It also tries to find out the category of patients who need ocular treatment and who do not need it.

MATERIAL AND METHODS:

All the patients suffering from Allergic Rhinitis with classical symptoms of nasal obstruction, watery nasal discharge and sneezing along with ocular symptoms of allergic conjunctivitis like Itching, watering, and congestion of the eyes were taken in the study. The diagnosis of Allergic Rhinitis was established by clinical evaluation and an elevated serum IgE levels. The patients were divided in three categories:

GROUP A: Anti allergic and topical non steroidal nasal medication. Their ocular symptoms were monitored for response.

GROUP –B: Topical nasal steroid treatment. Their ocular symptoms were monitored for response.

GROUP C: Anti allergic + Topical nasal steroid treatment. Their ocular symptoms were monitored for response.

25 patients were analyzed in each group, anti allergic treatment was given in the form of Tab fexofenadine 120mg once a day, topical non steroidal therapy was given in the form of xylometazoline nasal sprays, topical steroidal treatment was given with budesonide nasal sprays, No patient with severe allergic conjunctivitis was considered in the study as they require active ocular treatment for early relief. Patients were evaluated after 24 hours then after 7 days and finally after 14 days, and response to medication with respect to ocular itching, watering and congestion were noted.

OBSERVATIONS:

SYMPTOMATIC IMPROVEMENT / RESPONSE AFTER 24 HOURS.

	IRRITATION	WATERING OF EYE	CONGESTION
GROUP A (n=25)	18/25	16/25	14/25
GROUP B (n=25)	14/25	14/25	14/25
GROUP C (n=25)	18/25	16/25	14/25

Evaluation of patients after 24 hours showed that (18/25=72%) patients of group A and Group C showed improvement in itching as compared to (14/25= 56%) improvement in group B patients, concluding that antihistamines have a better control of itching in allergic conditions than steroids and its onset of action is faster than steroids as is the case in allergic rhinitis. Similarly watering of the eye was (16/25=64%) better controlled in Group A and C (16/25=64%) patients than in group B (14/25=56%) patients suggesting the same thing. The response on congestion was similar in all the three groups (14/25=56%) suggesting that antihistamines have a poor effect on the condition whereas steroids take a longer onset of action hence their effect after 24 hours was not that pronounced.

SYMPTOMATIC IMPROVEMENT / RESPONSE AFTER 7 DAYS

	IRRITATION	WATERING OF EYE	CONGESTION
GROUP A (n=25)	22/25	20/25	16/25

GROUP B (n=25)	18/25	18/25	20/25
GROUP C (n=25)	24/25	24/25	25/25

Evaluation of patients after 7 days showed that response of antihistamine increased from 72% in the first 24 hours to (22/25=88%) suggesting that there is an improvement in anti histamine response on itching with time, As seen in Group B steroids also gives relief in itching (the percentage increased from 14/25=56% to 18/25=72%) but the onset of action is slow, and are not as effective as antihistamines in doing so. But by the end of 7 days the patients of group C showed a (24/25=96%) improvement suggesting that best results are achieved by a combination therapy, suggesting further that steroids potentiate / act synergistically with anti histamines in relieving symptoms. Similarly watering of the eye was better controlled by a combination therapy (24/25=96%) as compared to (20/25=80%) in group A and (18/25=72%) in Group B patients. Nasal congestion was again better controlled by a combination therapy of Group C, as compared to antihistamine group A (16/25=64%) and the Steroid group B (20/25=80%). It also means that in mono therapy steroids control ocular congestion better than antihistamines as is the case in nose also.

SYMPTOMATIC IMPROVEMENT / RESPONSE AFTER 14 DAYS

	IRRITATION	WATERING OF EYE	CONGESTION
GROUP A (n=25)	24/25	24/25	23/25
GROUP B (n=25)	24/25	24/25	23/25
GROUP C (n=25)	25/25	25/25	25/25

Evaluation of patients after 2 weeks (14 days) suggested that response on the ocular symptoms (all three symptoms of itching, watering / congestion) was similar in Group A and Group B (24/25=96% in itching and watering and 23/25=92% in congestion) suggesting that although the initial response of steroids in relieving itching and watering was not as good as antihistamines but in the long course the effects are similar, similarly in relief of congestion the anti histamines are as effective as steroids in the long course. But the results in relieving all the three symptoms were best (100%) with a combination therapy.

DISCUSSION.

It is a well known fact that patients of allergic rhinitis suffer from Allergic conjunctivitis. Allergic conjunctivitis is a condition often under diagnosed and consequently under treated except when it is severe. The probable mechanisms of ocular involvement in allergic rhinitis are three fold

1. Ascending allergen / inflammation via the naso lacrimal duct.
2. Direct pollen / allergen exposure to the eye.
3. The naso-occular reflex.

One of the proposed mechanism of ocular involvement in allergic rhinitis is through the naso-lacrimal duct, this can happen while forceful blowing of the nose because of which the nasal secretions containing allergens reach the conjunctiva through the naso-lacrimal duct. This mechanism is largely considered irrelevant because of following reasons:

1. The opening lies below the inferior turbinate and is covered with a valve, the pollen exposure to this area is very low.
2. The direction of flow in the duct is from above downwards and retrograde flow is very unlikely and requires a considerable force which is very unlikely.

Thus this mechanism is not a likely mechanism for ocular symptoms.

This is also true for the topically applied intra nasal drugs reaching the conjunctiva via the naso lacrimal drugs – mechanism considered to be unlikely. On the contrary the ocular medications reach the nose via the duct and provide nasal relief but this aspect has not been the focus of study in this research.

Another theory of ocular involvement in allergic conditions is the direct ocular exposure to the allergens, the likelihood of this to happen is possible but low, the allergens can reach the conjunctiva on a windy day but the proportion of allergens reaching the nose is much high as it is the active breathing site than the conjunctiva, the amount is 10 fold less than the amount of pollen recovered simultaneously from the nose (2) The direct contact can be a plausible explanation for ocular involvement , but how much this contributes to the ocular symptoms in allergic conditions is unknown. The fact that topical intranasal steroids give relief in ocular symptoms in a patient with allergic conjunctivitis secondary to allergic rhinitis, which cannot occur either by direct effect of the drug on the conjunctiva or via systemic absorption, this is considered that this mechanism has a minimal contribution in ocular symptomatology.

The most accepted mechanism ocular involvement in allergic rhinitis is the Reflex mechanisms within the nose in response to allergens affecting the eye. The eye is richly innervated by parasympathetic nerves that enter the eyes after traveling in conjunction with the parasympathetic input to the nasal cavity. Parasympathetic innervations governing the tear film and nasal secretion can intersect at the pterygopalatine ganglion. (3)Nasal challenge with antigen induces a reflex in the contra lateral nasal cavity, known as the naso nasal reflex. This reflex can be seen with nasal challenge with cold, dry air and also with histamine. The contra lateral response to antigen, cold dry air and histamine is blocked by topical anti cholinergic agents applied to the contra lateral side, suggesting that the efferent limb is parasympathetically mediated. Histamine is only released on the side of challenge with antigen but oral H1 antihistamines reduce the contra lateral response to unilateral nasal allergen challenge, suggesting that histamine contributes to the initiation of the reflex. The eye is richly innervated by parasympathetic nerves which enter the eye after running in conjunction with the parasympathetic input to the nasal cavity. The investigators, therefore, hypothesize that the conjunctiva will respond to nasal allergen in a manner similar to the contra lateral nasal cavity. (2, 4)

It is also thought that in naso-occular reflex the mediators released from the allergic reactions in the nose leads to upregulation of circulatory cells which when reach the eye cause release more mediators and cause more symptoms.

No such previous study exists to the best knowledge of the author hence comparisons with the data of other study was limited.

In the present study a total number of 110 patients were seen suffering from Allergic Rhinitis out of which 75 pa-

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tients were suffering from allergic conjunctivitis of various extent (proved by elevated serum IgE) making a percentage of 68%, which is far above the incidence quoted by Baroody etal who quoted an incidence of 40% only.(5)

In the present study the serum IgE levels of all the patients were raised with a mean value of 400 IU/Lt. with a maximum of 1600 IU/Lt and the minimum being 300IU/Lt. The normal range of IgE in the present setup is less than 100 IU/Lt.

In the present study response in ocular symptoms was observed in all the three groups of patients even when no ocular treatment was given. The onset of relief of ocular symptom was within 24 hours in all the three groups but overall the response in ocular symptom was better when both antihistamines were used along with steroids in nasal allergy treatment, as compared to when only steroids were used which was still better as compared to when only antihistamines were used in the management of allergic rhinitis suggesting a dual mechanism involved in naso-occular reflex involving both neuronal and inflammation / histamine release. This is in conjunction with study conducted by Baroody etal(5)

Newer intranasal steroids decrease ocular symptoms, potentially achieving efficacy by suppressing the naso-ocular reflex, down regulation of inflammatory cell expression, or restoration of naso lacrimal duct patency. (1)

It was also observed that response to itching in eye was better with antihistamines whereas response to watering and redness was better with steroids as is the case in allergic rhinitis. Steroids also have a longer onset of action as compared to anti allergic and symptomatic improvements start after 48-72 hours.

CONCLUSIONS

- **The present study concludes that:**
- It is a well known fact that allergic conjunctivitis is a condition that coexists with allergic rhinitis. The incidence in the present study was found to be 30%
- **The mechanism of development of allergic conjunctivitis in allergic rhinitis is multi factorial which included:**
- Ascending allergen / inflammation via the naso-lacrimal duct.
- Direct pollen / allergen exposure to the eye.
- The naso-occular reflex.
- The improvement in ocular symptoms occurs even without active management of allergic conjunctivitis, especially with combination of steroidal and antihistamine treatment of allergic rhinitis than with either steroid or anti histamine treatment separately. Individually symptomatic response was better with steroids than with antihistamines.
- Antihistamines give a better response in itching as compared to watering and congestion both in eye and nose as compared to watering and congestion which are better controlled by steroids Steroids have a longer onset of action than antihistamines hence it is recommended that both should be started for early and adequate recovery in symptoms.
- It is recommended that mild to moderate cases of allergic conjunctivitis in allergic rhinitis can be treated with primary nasal therapy, although in severe cases primary ocular treatment is needed for a quick recovery.

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