ORIGINAL RESEARCH PAPER

Volume-8 | Issue-1 | January-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

IMPRESSION CYTOLOGY- A ROUTINE SUPPORTIVE DIAGNOSTIC TOOL FOR ALLERGIC CONJUNCTIVITIS

Ophthalmology

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ABSTRACT

Allergic conjunctivitis is the most common syndrome with a prevalence rate of 5- 22%. Diagnosis is difficult due to nonspecific presentation. Various time consuming diagnostic methods are present. Aim of our study is to evaluate that impression cytology is a routine supportive diagnostic tool for allergic conjunctivitis. 110 patients were included in study presenting with ocular itching, tearing, conjunctival hyperemia. Patients were graded as mild (n=32), moderate (n=65), severe (n=13) on basis of DECA*. Impression cytology of conjunctiva was done. Conjunctival eosinophilia was found in all patients. Several inflammatory cells were found in 71.88% (n=23) mild grade patients and abundant inflammatory cells were found in 100% moderate and severe grade patients. To conclude allergic inflammation and destruction starts early in disease. Impression cytology is a simple, reliable, cost effective, routine supportive diagnostic test to substantiate and document clinical diagnosis and help in treatment.

*Consensus Document on Allergic Conjunctivitis

KEYWORDS

Allergic, impression cytology, inflammation

INTRODUCTION

Allergic conjunctivitis is one of the most common syndromes that a general ophthalmologist is presented with, with a prevalence ranging from 5% to 22% in the general population (1,2). Allergic conjunctivitis is the most common clinical form of ocular allergy, and the underlying immune reaction tends to be mediated by IgE. There are few epidemiological data on allergic conjunctivitis, probably because of the lack of classification criteria, underdiagnosis of the condition, and the fact that the disease is often associated to allergic rhinitis, which draws scant attention.

The main symptom of allergic conjunctivitis is itching. Indeed, in the absence of such itching, the diagnosis should be questioned. Other symptoms such as lacrimation (tearing), red eye, foreign body sensation and edema (swelling) are also very frequent (3). The diagnosis is clinical but sometimes become difficult to diagnose due to nonspecific presentation. Various diagnostic modalities are available for diagnosis like tear levels of specific IgE, skin testing to aeroallergens, and ocular challenge with allergens are available but these methods are much time and cost consuming (4). So we evaluated the usefulness of conjunctival impression cytology to detect the eosinophilic reaction in allergic patients.

MATERIALS & METHODS-

It was a prospective hospital based study. Aim was to evaluate that conjunctival impression cytology is a routine supportive diagnostic tool for the understanding of the underlying immuno-pathology in allergic conjunctivitis. Total 110 patients fitting the inclusion criteria were included in study conducted over a period of 6 months. Inclusion criteria was patients presenting with ocular itch, watering & hyperemia. While patients with ocular discharge & those who were already on treatment for allergy were excluded from study. 0.22um millipore filter paper was used. Cellulose acetate filter remove superficial layers of ocular surface epithelium. Local anaesthetic instilled in eye. Excessive tear fluid and medication are wiped. Filter paper is smoothed onto ocular surface. Paper is kept in contact for 5-10min. Then peeled off with forcep filter paper is applied to clean glass slide for transferring impression smear by applying gentle pressure. Filter paper with specimen fixed for 10 min in fixative (Glacial acetic acid-1 part, Formaldehyde-1 part, Ethyl alcohol-20 part). Hematoxyline & Eosin staining was done for all cytology specimen. Patients were graded as mild, moderate, severe on basis of DECA (5) (Consensus Document on Allergic Conjunctivitis).

MILD	MODERATE (1-3 items)	SEVERE (4items)
• Signand symptoms are not • bothersome • No effect on vision • No interference in school or • work tasks • No difficulties for activities of daily living, reading, and/or sport	• Signs and symptoms are • bothersome • Effect on vision • Interference in school or work tasks • Difficulties in activities of daily living, reading, and/or sport	• Signs and symptoms are • bothersome • Effect on vision • Interference in school or work tasks • Difficulties in activities of daily living, reading, and/or sport

OBSERVATIONS-

Total number of patients included in study was 110 between age group of 7-40years. Number of patients having mild grade of allergy were 32, moderate grade were 65 & severe grade were 13. Photomicrographic examination of impression cytology showed mature squamous cells along with eosinophils, polymorphs & macrophages at 10x magnification (fig.1). While higher magnification (40x) showed mainly eosinophils along with few polymorphs & macrophages (fig.2).

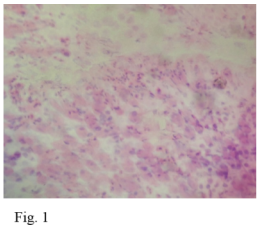


Fig. 1

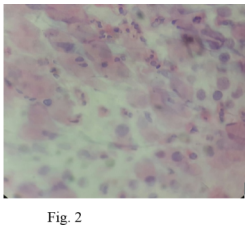


Fig. 2

Table 1

Category	Mild	Moderate	Severe
Number	N=32	N=65	N=13
Eosinophilia	Present	Present	Present
Inflammatory cells	Several (n=23)	Abundant(n=65)	Abundant(n=13)

Conjunctival eosinophilia was present in all patients. Several inflammatory cells were found in 71.88% (n=23) mild grade patients, while rest 28.12% of mild grade patients were having less

inflammatory cells. Abundant inflammatory cells were found in 100% moderate and severe grade patients .

DISCUSSION-

Allergic diseases of the eye are responsible for a wide range of human morbidity. In individuals with allergic conjunctivitis (AC) the number of mast cells in the substantia propria increase and the epithelium becomes densely infiltrated (6). Activation of mast cells by IgE bound-receptor crosslinking by allergens promotes the release of several mediators such as histamine, prostaglandins, leukotrienes, tryptase, and cytokines, all of them responsible for the symptoms of AC and the inflammatory changes in conjunctival cells. This further attracts eosinophils and neutrophils. Current evidence shows that eosinophils and their major basic proteins are also important in the chronic allergic process of ocular surface inflammation and epithelial damage (7). Most of the time, a patient is unlikely to seek medical attention if their symptoms are mild, and/or if they only persist for several days or weeks during the season. Furthermore, a generalist will only refer a patient to a specialist when the symptoms are severe enough to warrant additional attention. Conjunctival-challenge testing was the original method for evaluating allergic responses but it has been replaced by allergen skin test (8). However, it has been shown that there is a vague correlation between conjunctival- challenge test and skin-prick testing (9). In the routine medical workload in our city, diagnosis of these conditions is based only upon clinical history and evaluation. Many times a correct diagnosis is not made, nor the appropriate therapy prescribed. Our study shows that conjunctival impression cytology is a very simple, non-invasive , relatively easy, yield reliable information with minimum discomfort to the patient. It is an OPD (out patient department) procedure & does not require any specialized gadgets. In normal individuals, eosinophils are not found in the conjunctival epithelium, although a small number of these cells is present in the substantia propria of the conjunctiva (10). On the contrary, eosinophils are markedly increased in the substantia propria and infiltrate the conjunctival epithelium in allergy (11). In our study, we found that conjunctival eosinophilia, present in all patients, is diagnostic of allergy. Even the inflammatory reaction is present in mild type of allergy. It indicates that allergic process is ongoing, chronic & patient tends to ignore mild, early symptoms of ocular itch. Patients who are clinically graded as mild can also have several inflammatory cells. This simple technique of impression cytology can guide to start with appropriate treatment directing the inflammation & allergy to prevent further complications like dry eyes & corneal involvement. Pre & post treatment cytology examination helps to document progression or response to therapy.

CONCLUSION-

Conjunctival impression cytology is simple cheap routine supportive diagnostic test. It is a valuable tool in the understanding of ocular surface disorders and documenting sequential changes in ocular surface. It also provides important diagnostic finding to support clinical diagnosis. We can substantiate & document the clinical diagnosis.

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