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Original Research Article

Correlation between serum immunoglobulin levels and bronchial asthma

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Abstract: Immunoglobulins, also known as antibodies, are glycoprotein molecules produced by plasma cells (white blood cells). They act as a critical part of the immune response by specifically recognizing and binding to particular antigens. A hypersensitivity reaction initiated by immunologic mechanisms, mediated by IgE antibodies occurs in allergic asthma. The aim is to estimate and compare serum IgE levels in mild, moderate, and severe asthmatics and in normal subjects and to obtain a mathematical model describing the relationship between serum IgE levels and severity of asthma. A stratified sample of 50 patients within age group of 18-60 years and 34 male and 16 female asthmatic patients classified according to GINA classification. Serum IgE levels were estimated by using ELISA kit. Mean IgE in mild asthma patient was 444.4 IU/ml to 1002.3 IU/ml in severe asthmatics. Serum Immunoglobulin E levels were high in asthmatics and the value increase is dependent on severity of asthma. However, there was no statistically significant correlation since the variability in each level of asthma was very large.
Keywords: Allergy, bronchial asthma, immunoglobulin E, inflammation

INTRODUCTION:

Allergic diseases are common and their incidence has been continuously rising with the developments in technology and increasingly severe environmental pollution. Allergic diseases have a large social and economic impact that include the costs of health care, lost work and school hours, and lower quality of life. This occurs not only in industrialized and developed countries but also in the vast impoverished areas around the globe [1].

A significant risk factor for the increasing incidence of allergic diseases is the pervasive presence of allergens [2]. Humans are exposed to 8500 kinds of compounds and approximately 2800 of them, including certain cosmetics, are contact allergens [3]. The causes of the increasing incidence of asthma are not clear but several hypotheses have been proposed. Western researchers believe that the rapid rise in asthma over the past three decades in Western societies has been attributed to numerous diverse factors including increased awareness of the disease, altered lifestyle and activity patterns, and ill-defined changes in environmental exposures [4]. Children of smoking parents show a higher incidence of asthma than those of non-smoking parents and severe obesity is closely correlated with adult-female asthma [5]. Furthermore, the type and timing of microbial exposure also play an important role in the development of asthma [6].

Allergic diseases occur in people of all ages, from new borns to the elderly, and often in those with a genetic predisposition. Allergic diseases are often characterized by immediate allergic reactions and are mainly manifested as respiratory allergies, skin allergies, digestive tract allergies and anaphylactic shock. Common clinical allergic diseases include asthma, AR, allergic dermatitis, food allergies, allergic conjunctivitis, allergic purpura, and eosinophilic gastroenteritis. Understanding the epidemiology of common allergic diseases would provide a reference for their prevention and treatment.

MATERIALS & METHODS:

This is an observational study carried out in Department of respiratory medicine, Sumandeep Vidyapeeth University for duration of 6 months in which total number of patients detected were 50 and were evaluated on the basis of history and examination. For each of the patients the Forced Expiratory Volume 1 (FEV1) and IgE levels were measured. The pulmonary function test was done using computerized

spirometry. After taking the necessary aseptic precautions from the median cubital vein, two ml of venous blood was collected from each patient using vacutainers. Severity of asthma was categorized as mild, moderate and severe based on GINA (Global Initiative for Asthma) guidelines. Statistical analysis was performed with Student's t test by using SPSS version 10.0.

RESULTS:

Asthma was categorised into mild, moderate and severe with mean IgE level of 444.4 IU/ml, 657.4 IU/ml and 1002.3 IU/ml respectively in mild, moderate and severe asthma. Patients with severe Asthma have high IgE level as compared to mild and moderate cases. Asthma has very close relationship with serum immunoglobulin level.

Table 1: sex variation

SEX	PATIENTS
MALE	34
FEMALE	16

Table 2: relationship between asthma and S. IgE level

GROUPS	NO OF SUBJECTS	MEAN (IU/ml)
MILD	12	444.4
MODERATE	14	657.4
SEVERE	24	1002.3

DISCUSSION:

Asthma is of two types - extrinsic and intrinsic types. Atopic asthma is a subtype of extrinsic asthma in which patients who have a hyper-responsive airway, the scene for the reaction is set in large part by initial sensitization to Inhaled antigens and chemical antigens [7, 8]. Serum IgE level was predictive in asthma, and it may be used to differentiate between asthmatic and non-asthmatic individuals in conjunction with other biomarkers. Specific immunotherapy reduced serum total IgE level in 36% of patients with asthma [9].

CONCLUSION:

S.IgE level has very strong relationship to bronchial asthma and that even with its severity. Increase in severity of asthma leads to increase in the level of immunoglobulin level. It has variation with severity of asthma but do define the relationship between the severity of signs and symptoms.

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