ASSESSMENT OF NORMAL IgE LEVEL IN 0-14 YEAR OLD HEALTHY CHILDREN IN TEHRAN

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ABSTRACT

In order to determine the normal values of total IgE in children, 3270 sera were taken from 0-14 year old males and females in different parts of Tehran, the capital of Iran. The technique which was used to measure total IgE was ELISA method using monoclonal anti-IgE antibody.

The results of this research indicated that the lower value for IgE was detected in children at birth (X=3.53 IU/mL), while the highest value was in 10 year old children (X=74.63 IU/mL). Therefore, it has been concluded that with increasing age, the IgE level will also increase (r=0.919).

Regardless of the age value, the IgE content in both males and females are the same. But concerning age and sex, the IgE level in four year old girls was higher (X=44.92) than similarly aged boys (X=28.2) (P<0.01), while in eight year old boys, a higher value of IgE (X=66.42) was recorded in comparison to the same aged girls (X=49.59) (P<0.05).

INTRODUCTION

Since there have been different diagnostic values for immunoglobulin E (IgE) in allergic diseases, hyper-IgE syndrome and parasitic infections, thus it is very critical and important to have information regarding normal IgE levels in health to compare with disease situations.

In this regard, Johansson11 (revealed that the normal IgE level was lowest in infants, but highest in 20-30 year old adults. Berg, et al.2 indicated that in contrast to IgM and IgG, there was no difference in IgE levels in males and females. Grundbacher4 mentioned that the IgE levels in blacks and adults were higher than other individuals. According to Wittig,17 the IgE levels in men were higher than women. Strevens, et al.16 worked on 372 serum samples taken from 20-65 year old males and females and he obtained the mean IgE level of 12 IU/mL with no significant variations in different sexes and ages. In 1988, Bernstein, et al.3 recorded the lowest and the highest IgE levels in 1-4 and 9-11 year old children, respectively.

As it can be concluded from the above investigations, the IgE value may be affected by different factors such as race, age, sex, etc. Therefore, it is very important to determine the normal IgE value in our country to be used for comparisons with disease situations.

In this regard, the normal IgE level was detected in 0-14 year old children from different parts of Tehran.

MATERIALS & METHODS

Sera were collected from children at schools, nursery schools, and vaccination centers. The number of samples was determined using a pre-test.

In order to determine the presence of parasitic infection, stool samples were examined by three different methods such as direct examination, floatation, and formaldehyde-ether method at the same time.

Atopic children were distinguished based on

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Fig. 1. Distribution of age.

questionnaires containing signs and symptoms of allergic diseases in the children and their family.

The IgE level in each healthy individual was determined by ELISA sandwich method using anti-human IgE monoclonal antibodies conjugated with peroxidase (Enzygnost-IgE monoclonal, Behring Co.)

Fig. 2. Distribution of sex in 2103 samples.

RESULTS

3270 sera were collected totally, among which 1167 samples were not included in our study due to parasitic infections, allergic diseases, etc.

In order to gain statistically significant results, the total number of samples was determined using a pre-test. On the basis of pre-test a standard deviation of 45 units was calculated. Thus, to obtain 95% confidence for IgE levels with error less than 2 units, at least 2000 samples were needed totally from 0-14 year old males and females.

The number of samples needed for every age group was calculated using the following formula:

\[ n_i = \frac{\bar{S}_i n}{s_i} \]

where:
- \( n \) = total samples
- \( n_i \) = number of samples in age \( i \)
- \( s_i \) = standard deviation in age \( i \)

Fig. 3. Geographic distribution of 2103 samples.

Fig. 4. Distribution of age-groups in 2103 samples.
DISCUSSION

IgE level has significant diagnostic use in allergic diseases, parasitic infections, etc., therefore defining its normal value is very important for further investigations. \(^9,13,15,16\)

As such a value is affected by different factors such as genetic, race, age, sex, physiological and environmental conditions, therefore, determination of
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![Graph showing IgE levels by sex](image)

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