A Cross Sectional Study to Determine Correlation Between Total Serum IgE & Development of Allergic Manifestations in "O" & Non "O" Blood Groups among Young Healthy Adults of Gauhati Medical College & Hospital

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1. Introduction

- Immunoglobulin E are reaginic antibodies which mediate acute & sometimes life threatening allergic reactions in atopic patients.
- Higher concentrations of IgE may be found in sera of patients who have asthma, hay fever, eczema, Wiskott-Aldrich syndrome & helminthic manifestations. IgE forming plasma cells are found most commonly in the respiratory, gastric & intestinal mucosa & in the regional lymph nodes but a few are noted in spleen & other lymph nodes.
- Serum IgE & AEC being markers for airway inflammation & allergic diseases, there are not many studies showing their correlation with 'O' & non' O' blood group individuals. Moreover, no study has been conducted in Guwahati city to establish any correlation between Serum IgE in relation to 'O' & non 'O' blood group.

Objective
- Primary- To determine total serum IgE levels in young healthy adults of 'O' & non 'O' blood groups.
- Secondary- To find out the total serum IgE in young healthy adults & its relationship to development of allergic manifestations in respect of 'O' & non 'O' blood groups.

2. Materials & Methods

2.1 Materials used

a) Minividas auto analyser
b) Centrifuge machine
c) Items for venipuncture like, disposable needles and syringes, rectified spirit, test tubes (10ml), single use latex rubber gloves, cotton, clean glass slides, tourniquet, vacutainers

2.2 Duration of Study- 1 month

2.3 Study Group

1) Healthy individuals (Males /Females) between 19-35 years of age.
2) Subjects with chronic respiratory illnesses & age more than 35 years & less than 19 yrs were excluded from the study.

2.4 Sample Size

100 (Subjects were selected by random sampling method).Sample size calculated by the formula $4PQ/L^2$ where 'P' is the prevalence of allergic manifestations among blood group O individuals, consequent to increased serum IgE.

2.5 Ethical Clearance

It was obtained from Institutional Ethics Committee Gauhati Medical College, Guwahati.

2.6 Procedure
After taking consent from the subjects and filling up the questionnaire, general physical examination of the subjects were done (including systemic examination) & those that were found to be within normal limit, 4ml of venous blood were taken from them by venepuncture from antecubital vein after aseptic & antiseptic precautions. 3 ml in clotted vial 1ml in vial containing anticoagulant. 3 ml blood transferred quickly in the centrifuge at 3000 rpm with the supernatant serum taken in a micropipette and fed into the space for serum in the IgE kit and fed in minividas autoanalyser & results was found. The ABO blood group was found out by using saline suspension and comercially available antisera .

3. Results

- Statistical analysis was done by using Graph Pad software. "t-test" two sample assuming unequal variances was done to calculate the "p-value". Test was considered

to be significant if "p-value" was <0.05 i.e. 95% confidence limit.

- As shown in the table below, both mean & standard deviation were calculated and the differences were statistically insignificant as evidenced by a 'p' value greater than 0.05.

Table: Values of Serum Ige showing Mean & Standard Deviation in "O" & Non "O" Blood Group with 'P' Values

Parameter	"O" Blood Group (Mean ± SD)	Non "O" Blood Group (Mean ± SD)	P-Value
Serum IgE IU/ml	985.568(M)	852.934(M)	0.35186 (One tail)
	1128.539(SD)	949.564(SD)	0.7037 (two tail)

Scatter diagram showing relationship between IgE levels in Non O and O Blood group
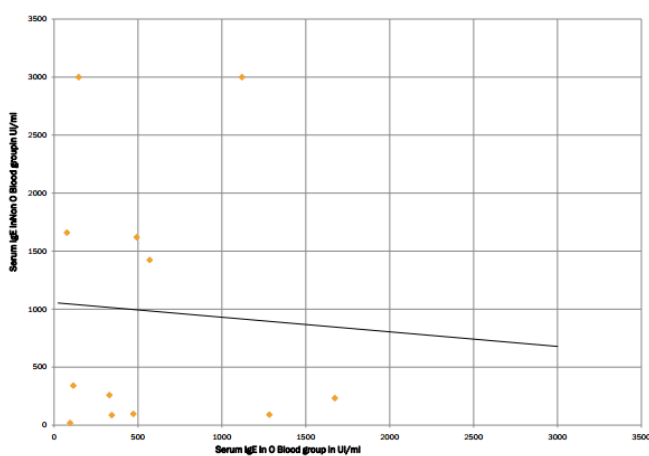
r = - 0.058, so slight negative correlation,
p value = 0.056, which is greater than 0.05, so the correlation is insignificant.

4. Discussion

The study was done keeping in mind paucity of studies showing any causal relationship of allergic manifestations with level of serum IgE and "O" & non "O" blood group preponderance in the rise of this allergic marker amongst healthy young individuals in the rapidly urbanized environment of Guwahati city so that corrective measures can be instituted on a personal, therapeutic & environmental level early in the course of the disease.

The subjects were from Guwahati & adjoining areas who visits the city on a regular basis in search of jobs or doing jobs, students or for business purpose.

The sample of the subjects selected were representative of the population living in this area in respect of –blood group system. Based on the 'p' value & the correlation coefficient the strength of association between serum IgE with any phenotype of ABO-blood group system is not established. But it does not rule out the possibility that such individuals are not with the risk of developing allergic manifestations & diseases as many other factors contribute to development of such diseases. IgE inducers like allergens, viral infection, air pollution triggers the production of IgE antibodies which

binds to mast cells & basophils containing inflammatory mediators such as histamine which are released into the blood stream. Many other factors have been suggested to play a role in the development & expression of of the atopic diseases including changes in lifestyle , pollution, dietary changes with diminished nutritive value & stress along with family history of allergies, cigarette smoke exposure & male gender (due to high expression of inflammatory proteins & more exposure to atmospheric pollutants). So it is evident that development of allergic manifestations with preponderance of any ABO group system is multifactorial.

5. Conclusion

The study could not establish positive correlation between serum IgE & development of allergic manifestations in O& non O blood group among young healthy adults as it is evident that development of allergic manifestations has a multifactorial etiology, however, increased sample size with prospective cross -sectional study may reveal a positive correlation as serum IgE is the most potent allergic marker & represents mediator for immediate hypersensitivity reaction & helminthic infestation.

6. Summary

Although serum IgE is considered to be a hallmark of Type-1 hypersensitivity, it does not establish itself as a sole marker for allergic manifestations to develop, in fact it appears to be a conglomeration of the factors which needs to be further studied &evaluated.

References

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