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Observations on the Incidence of Allergic Rhinitis in Different Blood Groups in N.C. Medical College, Israna

Rakesh Kumar[1], Babita Rani[2], Ashish Kumar Malik[3], Priyanka Tetarwal[4]

[1]Assistant Professor, Department of ENT, N.C. Medical College, Israna, Panipat
[2]Dy. CMO, NFL Hospital, Panipat
[3]Assistant Professor Department of Psychiatry, N.C. Medical College, Israna, Panipat
[4]Former Resident, Department of Anaesthesia, S.P. Medical College, Bikaner

Corresponding Author: Priyanka Tetarwal

ABSTRACT

Background: Allergic rhinitis (AR) is a common atopic disorder with both environmental and genetic components.
Aim: To find association, if any, between ABO blood group system and AR in Indian population.
Methodology: This was a cross-sectional study, conducted at the N.C. Medical College, Israna, Haryana. It is based upon the observations made upon 50 cases of allergic rhinitis from patients attending Ear, Nose and Throat Department of the N.C. Medical College, Israna. A control group of 2657 patients was collected from Department of Blood bank of N.C. Medical College, Israna. Blood group determination was conducted for consenting individuals along with routine investigations and prevalence of AR in each blood group was found and subsequently compared for results.
Results: Among the controls blood group 'B' was most common (n=1006); whereas among the cases, 'O' was most abundant (n=17). The blood group 'O' was found to be higher among AR patients (difference of +3.11). However, the comparison between cases and controls was not found to be statistically significant (p-value of 0.791).
Conclusion: The current study shows that the blood group 'O' is more common in patients with AR as compared to control group. However, there was no significant statistical difference between blood groups of cases and controls.

Keywords: Allergic rhinitis, atopic, ABO blood group

INTRODUCTION

Allergic rhinitis (AR) is an atopic disorder, inflicting susceptible individuals with nasal mucosa inflammation upon repeated exposure to air-borne allergens.[1]it remains one of the most common chronic conditions, affecting approximately 600 million individuals worldwide.[2] Similar to any other allergic condition, AR too involves an early inflammatory response characterized by IgE-mediated release of preformed histamine from activated mast cells, and the late phase reaction dependent upon generation of mediators like leukotrienes (LTs), and numerous effector cells.[1,3] However, the pathogenesis is complex and multifactorial in origin, with both environmental and genetic components being essentially involved.[4] Indeed one of the environmental theories connecting with the recent trend of increasing prevalence of atopic disorders has been the 'hygiene hypothesis', i.e., extreme protection from environmental infectious stimuli, interfering and hampering the development of immune system.[2]

While many candidate genes have been markedly associated with AR, including inter alia, IL-4, IL-13, HLA-DRB, TNF, LTA and FOXP3; the blood group

systems- ABO, Lewis, etc.- have also been studied in this context.[4]A hypothesis that ABO agglutinins derived from a variety of pollens, might interact with cells containing blood group antigens in the respiratory epithelium, ignited the interest in evaluating association of blood group systems with atopic conditions.[2,5]The results in this context have been rather contradictory. While the study by Bijanzadeh et al[6] on Indian population failed to find any association between ABO blood group and AR, assessment by Saini and Yadav[7] was able to establish blood group 'O' as possible association with asthma. Similar findings in patients with AR were established in the study by Topno et al[8], who found that 'O' blood group phenotype was significantly associated with AR.

However, the studies on AR are very limited in North Indian population, and existing studies have been conducted with small sample size and not amounting to an effective comparison. The current study attempts to remove the shortcomings in past studies and aims to find association, if any, between ABO blood group system and AR in Indian population.

MATERIAL AND METHODS

The study was a cross-sectional one, conducted at the N.C. Medical College, Israna, Haryana. It is based upon the observations made upon 50 cases of allergic rhinitis from patients attending Ear, Nose and Throat Department of the N.C. Medical College, Israna. The period of sample collection was August 2017 to July 2018, and only the consenting individuals were admitted to the study sample. Upon diagnosis, blood group determination was conducted for consenting individuals along with routine investigations and prevalence of AR in each blood group was found. The results were compared with blood group prevalence of a control group, comprising of 2657 subjects from blood bank. The data was entered in MS excel and descriptive statistical tools were used for analysis and drawing observations. For comparing the control and the case group, Chi-square test was applied with p-value of <0.05 considered to be significant.

RESULTS

Table 1. Prevalence of different blood groups in case and control population.

	O	A	B	AB	Total
Control	821	588	1006	242	2657
Case	17	11	16	6	50

Table 2. Comparing the incidence of different blood groups between case and control population.

	O	A	B	AB	p-value
Control	30.89%	22.13%	37.86%	9.10%	
Case	34.00%	22.00%	32.00%	12.00%	0.791
Difference	+3.11	-0.13	-5.86	+2.90	*(Insignificant)*

It was found that the blood group 'B' was most common (n=1006), followed by blood group 'O' (n=821); whereas among the cases, 'O' was most abundant (n=17), followed by 'B' (N=16). Blood group 'AB' was least common in both controls as well as controls (n=242 and n=6, respectively) (Table 1) An inspection of the Table 2 reveals that the incidence of blood group 'O' was found to be higher among AR patients (difference of +3.11), while the least common blood group among AR patients was blood group 'B' (difference of -5.86). However, the comparison between cases and controls was not found to be statistically significant (p-value of 0.791). (Table 2)

DISCUSSION

Purpose of the index study was to examine the association of ABO blood groups with AR, if any, and to understand the predominant blood group type with this disorder. The literature has been equivocal for the association of atopic conditions with ABO blood groups. This dilemma has been highlighted in the literature review by Carpeggiani[2], concluding that the association of blood group O with allergic rhinitis continues to be unknown. The

current study shows that the blood group 'O' is more common in patients with AR as compared to control group. However, there was no significant statistical difference between blood groups of cases and controls. The results of the present study support the observations by Dhiman et al[9] and Bijanzadeh et al[6] on asthmatic patients in India. In contrast to this, study on patients with AR in India by Topno et al[8], found that 'O' blood group phenotype was significantly associated with AR. Similar findings were made by Hamad[10] in his study on AR patients and Iraq and established that blood group was significantly associated with AR.

CONCLUSION

The hypothesis associating ABO blood group system with AR has not been helped with any substantial evidence as most of the research has yielded contradictory results. Also, there are no known biological mechanisms connecting ABO blood group system with AR. There is a need to assess other blood group systems in this context and future studies might be more biologically oriented to draw better conclusions.

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