



ORIGINAL RESEARCH PAPER

Physiology

PREVALENCE OF TUBERCULOSIS IN ABO BLOOD GROUP: A CROSS SECTIONAL STUDY

KEY WORDS: Tuberculosis, Extrapulmonary tuberculosis, Blood groups, BMI.

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ABSTRACT

Introduction: Tuberculosis is the most prevalent disease in developing countries. Paucity of research has been observed in determining the relationship of biochemical composition of blood group antigen and risk for tuberculosis infection. The present study was aimed to observe the pattern of ABO blood group distribution in relation to tuberculosis cases

Material and method: 180 Medical Records were analyzed in this study. The obtained results were expressed as mean ± standard deviation. Continuous variables were analyzed using ANOVA test followed by Turkey's Positive comparison. Categorical variables were analyzed by Chi-Square test. P< 0.05 is considered significant.

Result and Discussion: Pulmonary TB and extrapulmonary TB was more prevalent in O blood group. Whereas, in AB blood group prevalence of pulmonary tuberculosis was maximum without any extrapulmonary tuberculosis

INTRODUCTION

Tuberculosis (TB) is a communicable, chronic granulomatous infectious disease and a major health problem in developing countries like India. Incidence of tuberculosis is high wherever there is poverty, overcrowding and chronic debilitating illness. Blood group is defined by the structure of oligosaccharide specific to a particular antigen. The antigen antibody interaction explained by Carl Landsteiner gave a platform for further research on the correlation of blood group antigens with different varieties of antigen present in the body irrespective of whether they are endogenous or exogenous. Literature is lacking in the field of determining the relationship of identification of differences in the biochemical composition of blood group antigen to risk in tuberculosis^[1].

The source of infection is patients with active open case of tuberculosis^[2]. According to Global tuberculosis report 2017. Geneva: World Health Organization; 2017, tuberculosis is ranked worldwide to be the ninth leading cause of death and the leading cause from a single infectious agent standing above HIV/AIDS. In 2016, around, 374000 TB deaths have been occurred among HIV positive and 1.3 million deaths among HIV negative people. 10.4 million people were estimated to fall ill with TB out of which 65% were male, 90% were adults, 10% were people diagnosed with HIV and around 56% were citizens of India, Pakistan, Philippines, Indonesia and China. Drug resistant tuberculosis is considered as an horrifying threat. There were 600 000 new cases in 2016, resistant to the most effective first-line of drug, rifampicin (RRTB), out of which 490 000 were multidrug resistant TB cases. The incidence rate of TB is falling at about 2% per year, rate of mortality is falling at about 3% per year and 16% die from the disease which by 2020, need to decrease to 4-5% per year and 10% percent respectively, to accomplish the first milestone of the 'End TB strategy'^[3]. The government of India has announced in March 2017 that, the elimination of TB by 2025, is the new aim. To achieve this, special precautions and cure has to be given to the most susceptible population^[4].

The present study is aimed at observing the pattern of ABO blood group distribution in relation to tuberculosis cases from the regions of South Karnataka.

MATERIALS AND METHODS

This is cross sectional study done through the observation of the obtained medical records from the department of pulmonary Medicine Sample size was 180 cases. Institutional ethical committee approval was obtained before starting the work. All the TB diagnosed cases above the age of 15yrs were

included in the study. TB cases below 15 years of ages and any concurrent illnesses which may affect the pulmonary, autonomic, and cardiovascular functions or any other systems were excluded from the study.

STATISTICAL ANALYSIS:

Results are expressed as mean ± standard Deviation proportion. Continuous variables were analyzed using ANOVA test followed by Turkey's Positive comparison. Categorical variables were analyzed by Chi-Square test. P< 0.05 is considered significant.

RESULTS:

Table-1: Comparison of incidence of tuberculosis with different blood groups with age, gender and body mass index

Blood group	A (n=32)	B (n=39)	AB (n=12)	O (n=97)	P value
Age	47.84 ± 16.36	47.10 ± 11.53	48.75 ± 15.01	48.82 ± 15.87	0.93
Gender (M/F)	18/14	22/17	7/5	61/36	0.86
Weight	42.16 ± 10.71	44.92 ± 10.64	51.08 ± 20.94	44.76 ± 10.33	0.15
Height	156.94 ± 9.44	160.18 ± 8.80	161.75 ± 9.98	161.16 ± 9.22	0.14
BMI	16.59 ± 4.70	17.26 ± 3.96	18.42 ± 5.92	16.99 ± 3.82	0.62

The average age group found among the sample is 48.40 ± 14.86. O blood group has the highest prevalence for TB, with males predominating over females. The patients are mostly underweight as the BMI comes to 17.41 ± 4.13.

Table-2: Comparison of prevalence of tuberculosis with pulmonary, extrapulmonary and MDR tuberculosis

Blood Group	A	B	AB	O	P value
Pulmonary TB	28 (87.5%)	32.1 (77.8%)	12 (100%)	78 (80.4%)	0.34
Extra Pulmonary TB	2 (6.2%)	5 (12.8%)	0	17 (17.5%)	
MDR TB	2 (6.2%)	2 (5.1%)	0	2 (2.1%)	
Total	32 (100%)	39 (100%)	12 (100%)	97 (100%)	

Pulmonary TB is most common compared to other types and it is more prevalent among AB blood group followed by A, O and B.

DISCUSSION:

The present study shows the correlation of different blood group with different types of TB along with other parameters in South Karnataka population. The O blood group is found to have maximum TB cases as per Table-1. This may be due to increased prevalence of O blood group in the population. Further, the absence of A and B antigen might also be responsible for its prevalence ^[5,6,7,8]. O blood group was followed by B, A and AB in its prevalence ^[9]. Males have more incidence than females, as they are more exposed to work outdoors compared to females in these regions. Decreased BMI was observed in these patients as the immunity falls to the lowest level for the disease manifestation. The BMI was lowest in the blood group A, O and B and comparatively higher AB as it had least prevalence. This may also be due to increased risk of other diseases along with TB ^[10].

Positive Pulmonary TB is found most commonly in AB blood group individuals(100%), according to Table- 2. This is in accordance with the study done by Jain RC ^[11], who noted a higher incidence PTB in AB group individuals. Followed by A, O and B. This association of blood group with Pulmonary TB is necessary for genetic constituent of future research work on individual person with specific antibody or antigen production. The blood group A is comparatively more susceptible to MDR TB when compared to other blood groups which brings into conclusion that A antigen is mostly drug resistant.

CONCLUSION:

As per the results, the individuals with the O blood group should be advised to take extra measures and precautions and also to maintain a good BMI which will help in reducing the incidence of TB.

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