

ABO Blood Group: Its Relationship with Anthropometric Parameters Among Young Adult Population in Kurnool, Andhra Pradesh

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Abstract:-

➤ Introduction

It had been established that ABO blood group system associated with some diseases or disorders. The objective of this study was to determine the effect of ABO blood group on anthropometric indices in young adult population in Kurnool, AP.

➤ Objectives

To study relationship between ABO blood group and height, weight, BMI & BSA among young adult population in Kurnool, AP.

➤ Material And Methods

Two Hundred and fifty apparently healthy young adults were randomly selected. The weight (kg) and height (cm) of the participants were measured following standard protocol. Body mass index (BMI) and body surface area (BSA) were estimated from weight and height using Quetelex and Mosteller formulae respectively. Chi square was used to compare grouped data while comparison of means of parameters among the four blood groups was done using Analysis of Variance (ANOVA). A p-value of < 0.05 was taken statistically significant.

➤ Results

Out of the total 250 participants, 52% were males & 48% were females. The mean \pm SD of height (cm) of participants was 166.3 ± 9.42 . The mean \pm SD of weight (kg) of the participants was 60.28 ± 12.04 . The mean \pm SD of BMI in kg/m² was 21.81 ± 4.14 , while the mean \pm SD of BSA (m²) was 1.66 ± 0.18 . Participants below 150 cms were of 3% B blood group & 1.5% O group respectively and participants above 181 cm were 12% A blood group 15% AB blood group (p value 0.002 and chi square 20.62).

➤ Discussion

In my study height was positively correlated with A & AB group & Negatively correlated with B & O group similar to study by Selçuk Nas et al & JD Kark et al.

➤ Conclusions

Several epidemiological studies have reported that the distribution of different ABO blood groups vary markedly among the populations of different geographical areas reflecting racial differences and results of this study blood group on anthropometric indices in young adult population in Kurnool, AP has come significant.

Keywords:- ABO Blood Groups, Anthropometry, Young Adult.

I. INTRODUCTION

The term “blood group” refers to the entire blood group system comprising red blood cell (RBC) antigens whose specificity is controlled by a series of genes which can be allelic or linked very closely on the same chromosome.

“Blood type” refers to a specific pattern of reaction to testing antisera within a given system. Over a period of time, our understanding on blood groups has evolved to encompass not only transfusion-related problems but also specific disease association with RBC surface antigens. [1]

Karl Landsteiner has been credited for the discovery of ABO blood group system in 1900. The genes of these blood group systems are mostly autosomal, The antigens can be integral proteins where polymorphisms lie in the variation of amino acid sequence, glycoproteins or glycolipids.

Among the 33 systems, ABO remains the most important in transfusion and transplantation since any person above the age of 6 months possess clinically significant anti-A and/or anti-B antibodies in their serum. [2]

The ABO blood group system is unique in immunology and haematology because it is the only system in which antibodies are consistently and predictably present in the serum of normal individuals whose red cells lack the antigens.[3]

Several epidemiological studies have reported that the distribution of different ABO blood groups vary markedly among the populations of different geographical areas reflecting racial differences. [4]

II. OBJECTIVES

Blood group association with anthropometric indices among young adults in South Indian population is rarely studied.

Its The ABO blood group system is known to be one of the genetic make-up of an individual that may provide much valuable information for early detection of vulnerable groups for abnormal BMI such as obesity.

III. MATERIALS AND METHODS

Two Hundred and fifty apparently healthy young adults was randomly selected. The weight (kg) and height (cm) of the participants were measured following standard protocol. Body mass index (BMI) and body surface area (BSA) were estimated from weight and height using Quetelet and Dubois formulae respectively. Chi square was used to compare grouped data while comparison of means of parameters among the four blood groups was done using Analysis of Variance (ANOVA). A p-value of < 0.05 was taken statistically significant. [5]

IEC clearance and informed consent was obtained.

- Study design: A Cross sectional study
- Study area: Department of Physiology, Kurnool Medical College, Kurnool
- Study participants: 18 to 21 years old youths from various colleges in Kurnool
- Sampling method: Simple Random Sampling
- Study period: August 01, 2022 - September 31, 2022
- Sample size :250.
- Inclusion criteria: Age group of 18-21 years.
- Exclusion criteria: Known bleeding disorders, Known hormonal disorders .
- Study tool: Sample was collected from superficial cubital vein and blood grouping was done using ABO typing, Height and Weight of the subjects was recorded using recommended standard equipment's.
- Statistical analysis: Data analysis was done by using SPSS-21.

IV. RESULTS

Fig.1 Out of 250 subjects 42 were A group, 92 were B group, 33 were AB group & 83 were O group

Fig.2 Out of 250 subjects 130 are male & 120 are female. There was no significant gender difference

Fig. 4,5,6&7 The mean \pm SD of weight (kg) of the participants was 60.28 ± 12.04 . The mean \pm SD of BMI in kg/m^2 was 21.81 ± 4.14 , while the mean \pm SD of BSA (m^2) was 1.66 ± 0.18 . participants below 150 cms were of 3% B blood group & 1.5% O group respectively and participants above 181 cm were 12% A blood group 15% AB blood group (p value 0.002 and chi square 20.62).

- P value - < 0.024 significant Over weight & Under weight are more in blood group B & O
- P value - < 0.002 significant. Blood group B is associated with short stature. Blood group A & AB is associated with tall stature
- P value - < 0.0001 significant. Over weight & Under weight are more in blood group B & O
- Body Surface Area was calculated and mean was taken and with its reference high and low values was considered for males & females separately. Blood group B was positively associated with high & low BSA

V. CONCLUSION

- From this study, the highest mean height was found in blood group A & AB which is in line with the report of Chaitra, et al. in a study done among 120 young adults of Kasturba Medical College, Mangalore in India within the age range of 18-22 years. [7]
- This is in contrast with blood group B reported by Kuar in 2014 in study done among post-menopausal females between 45 to 80 years of age living in India. This contrast may be due to the age difference among the participants. [8]
- Highest mean BMI was found in blood group B & O which is in contrast with the studies of Ainee, et al., Amela, et al. and Chaitra, et al. in studies done among young adults. [8][9]
- The high BMI in this blood group may predispose them to metabolic syndrome. This was in contrast with a study by Jafari, et al. which reported highest BMI in blood group A. [6]
- The lowest mean BMI was in blood group A. this could be due to preference of this blood group for fruits and vegetables as earlier reported by Lam[10]
- Height was significantly higher among Blood group A & AB and short stature was associated with blood group B & O which is in contrast with the study done by asafa ma et al.,
- The highest and lowest Body Surface Area among both males and females was positively associated with blood group B which is in contrast with blood group AB in the study done by asafa ma et al.,[11]

A. Figures and Tables

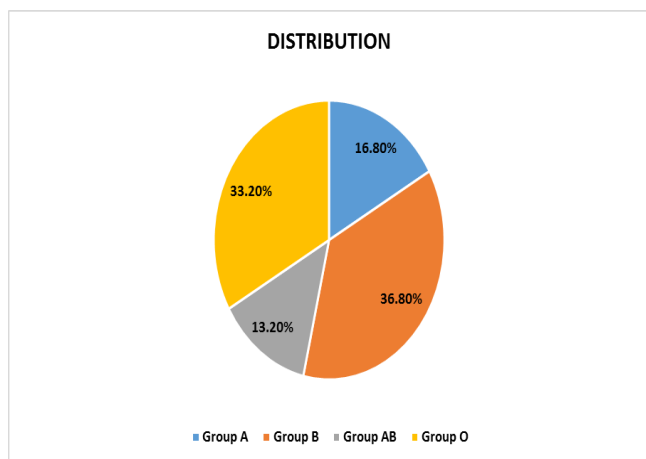


Fig. 1 Distribution of study population



Fig. 4 Weight distribution among blood groups

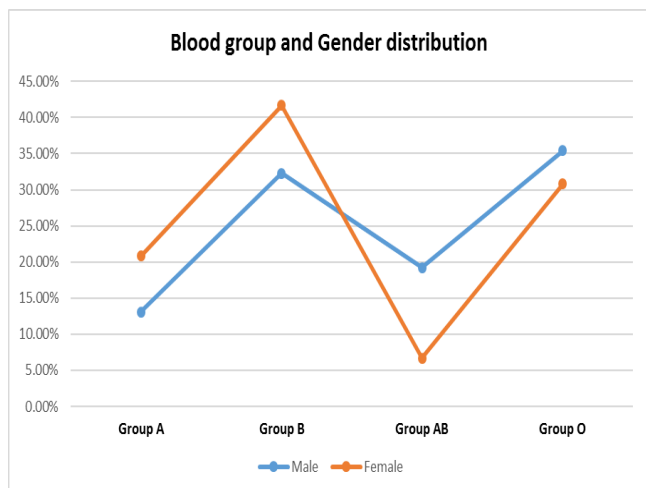


Fig. 2 Gender distribution of study population

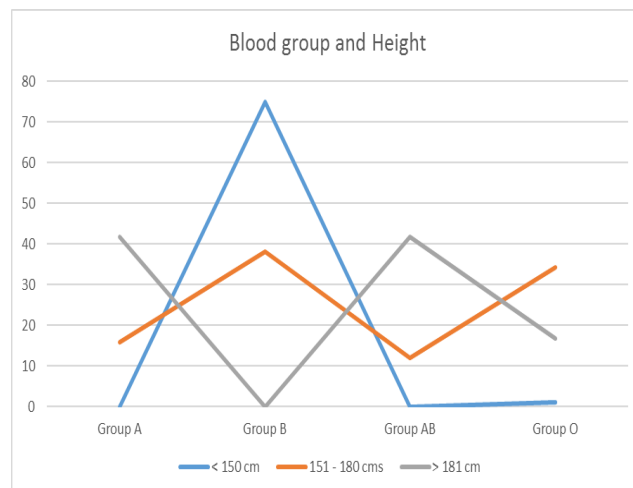


Fig. 5 Height distribution among blood groups

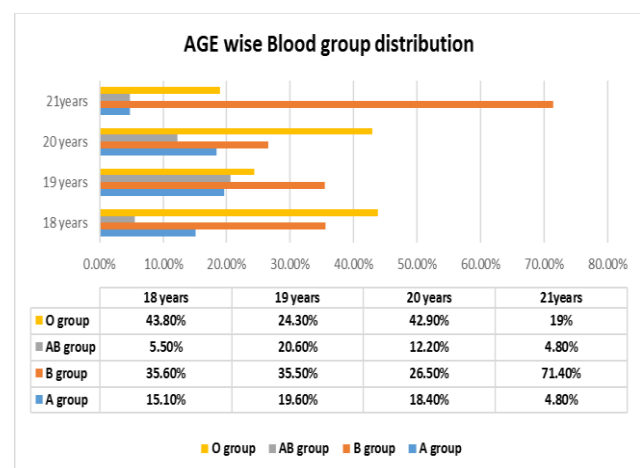


Fig. 3 Age distribution of study population

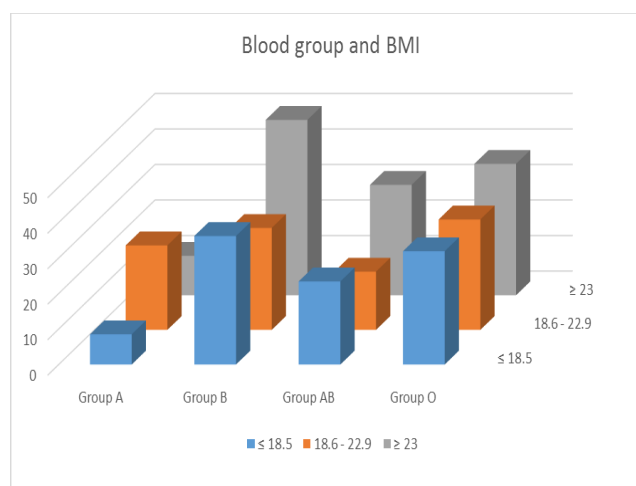


Fig. 6 BMI among blood groups

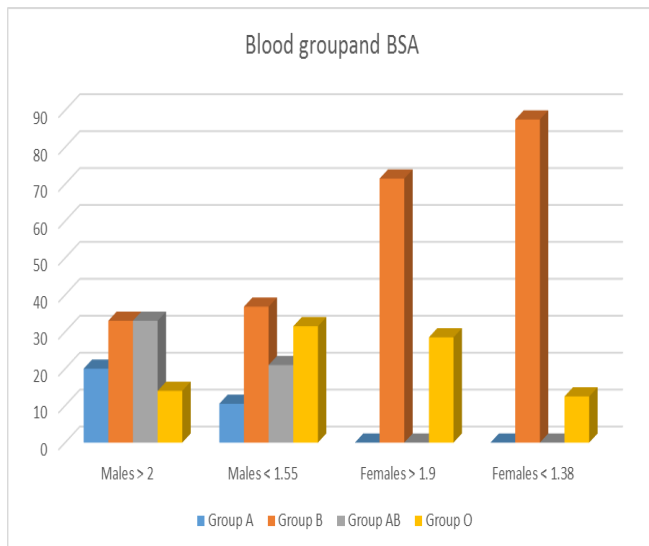


Fig. 7 BSA among blood groups

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