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ABO Blood Groups and Risk for Obesity: A Retrospective Study from Rural Tertiary Care Hospital of South Karnataka

Jayakumar Papanna[1], Shruthi Bettegowda[2]

[1]Assistant Professor, [2]Associate Professor,
Department of Medicine, Adichunchanagiri Institute of Medical Sciences, Balagangadharanatha Nagar, Nagamangala, Mandya -571448, India.

Corresponding Author: Shruthi Bettegowda

ABSTRACT

Background: Genetic factors are one of the non modifiable risk factors for obesity. The ABO blood group is one such pivotal genetic determinant that can give valuable information for early detection of risk population. The objective of our study was to assess the relationship between blood group and obesity.
Method: Hospital records of all blood donors, who donated their blood in the blood bank from March 2018 to march 2019 was reviewed. In this retrospective study1514 blood donor records were reviewed. All available data for each donor was studied in detail to determine distribution of ABO and Rh blood group in these individuals. Details about height and weight were collected from hospital records. Blood groups were determined using the slide haemagglutination technique.
Result: In the present study of 1514 patients, obese individuals constituted 29.26% followed by overweight (26.28%) individuals. The highest percentage of obese individuals (19.01%) had blood group O, 5.54% had blood group B, 3.29% had blood group A, and the least percentage (1.38%) had blood group AB. Maximum number of overweight persons belonged to O blood group (14%).
Conclusion: This study showed that more obese and overweight individuals were belonged to blood group O and fewer patients were in blood group AB. More population based studies with large sample size needed in future; various geographical areas and populations should be considered.

Key words: ABO blood groups, Obesity, Overweight

INTRODUCTION

Obesity is one of the growing medical problems in India, were more than 135 million individuals were suffering from obesity and overweight. Obesity results into various health problems which are having direct link to cardiovascular disease. [1] There are studies claiming relation of ABO blood groups to overweight and obesity. [2-6] Some studies concluded that there was no association between development of obesity and a particular blood group. [7,8] Even though the blood group is a non modifiable risk, having knowledge of association between obesity and blood group can help to make healthy life styles. These healthy life styles can be implemented in early life of at risk individuals as a preventive measure before the development of obesity and its complications. Although obesity is very common in south India, studies on blood groups in obese individuals from rural Indian areas are lacking. With this background, the present study was undertaken, to assess the distribution of ABO blood group and Rh system in overweight, obese individuals. The aim of this study was to find out the association between ABO and Rh blood groups with overweight and obesity.

MATERIAL AND METHODS

Hospital records of all blood donors, who donated their blood in the blood bank of Adichunchanagiri institute of medical sciences, Balagangadharanatha Nagar, Karnataka from March 2018 to March 2019 was reviewed. All available data for each

donor was studied in detail to determine distribution of ABO and Rh blood group in these individuals. Details about height and weight were collected from hospital records. Donors with incomplete details were excluded from this study. Ethics committee approval was taken for the study. Height was measured in centimetres by using a non-stretchable standard tape with a metal buckle at one end. Weight was measured by electronic weighing machine. A person's body mass index (BMI) was determined by calculating the ratio between the body weight in kilograms and height in meters squares (kg/m2). According to BMI persons was classified as underweight if BMI <18.5kg/m^2, normal 18.5 - 24.9 kg/m^2, overweight 25-29.9 kg/m^2 or obese ≥30kg/m^2. ABO and Rh blood grouping was determined by slide haemagglutination method.

Data Analysis: Data were compiled and tabulated by using standard appropriate statistical technique, which includes numbers and percentages.

RESULTS

In this study 1514 donors details were reviewed. All donors were male. Table 1 shows the distribution of ABO blood group among donors. Maximum number of donors belonged to O blood group (39.16%) fallowed by A blood group(25.16%).

Table 1: Distribution of ABO blood group

Blood group	Number donors(Percentage)
A+ ve	381(25.16%)
A- ve	22(1.45%)
B+ ve	351(23.18%)
B- ve	26(1.72%)
AB+ ve	103(6.80%)
AB- ve	3(0.19%)
O+ ve	593(39.16%)
O- ve	35(2.31%)
Total	1514

Table 2 shows the distribution of Rh factor among blood donors. Rh factor was positive in 1428(94.32%) donors.

Table 2: Distribution of Rh factor

Rh factor	Number donors(Percentage)
Rh factor + ve	1428(94.32%)
Rh factor- ve	86(5.68%)
Total	1514

Table 3 shows the distribution of participants according to BMI, ABO blood group, and Rh blood group. Obese individuals constituted 29.26% followed by overweight (26.28%) individuals. The highest percentage of obese individuals (19.01%) had blood group O, 5.54% had blood group B, 3.29% had blood group A, and the least percentage (1.38%) had blood group AB. Maximum number of overweight persons belonged to O blood group (14%).

Table 3: Distribution of blood group and BMI

Blood group	Overweight(Percentage)	Obese (Percentage)	Normal (Percentage)
A+ ve	80(5.28%)	49(3.23%)	252(16.64%)
A- ve	5(0.33%)	1(0.06%)	16(1.05%)
B+ ve	56(3.69%)	75(4.95%)	220(14.53%)
B- ve	7(0.46%)	9(0.59%)	10(0.66%)
AB+ ve	37(2.44%)	20(1.32%)	46(3.03%)
AB- ve	0(0%)	1(0.06%)	2(0.13%)
O+ ve	201(13.27%)	282(18.62%)	110(7.26%)
O- ve	12(0.79%)	6(0.39%)	17(1.12%)
Total	398(26.28%)	443(29.26%)	673(44.45%)

Table 4 shows the distribution of participants according to BMI and Rh factor. Rh factor was positive in 374(24.70%) overweight and 426(28.13%) obese individuals.

Table 4: Distribution of Rh factor and BMI

Rh factor	Overweight(Percentage)	Obese (Percentage)	Normal(Percentage)
Rh factor + ve	374(24.70%)	426(28.13%)	628(41.47%)
Rh factor- ve	24(1.58%)	17(1.12%)	45(2.97%)

DISCUSSION

Recent studies have shown that obesity is increasing globally. There is growing evidence showing genetic influence on obesity. [1] Previous studies have shown blood group associations with various

diseases like peptic ulcer, carcinoma, diabetes mellitus type 2, hypercholesterolemia, hypertension, and myocardial infarction. [3] Several studies have showed a pivotal role of the ABO blood group system in the susceptibility to overweight and obesity. [2-6] The finding of obesity and blood group association emphasizes the fact that knowledge can be utilized to initiate healthy life style in the risk population. In this study more obese persons were belonged to blood group O(19.01%) fallowed by blood group B(5.54%),blood group A (3.29%)and blood group AB(1.38%). Maximum number of overweight persons belonged to O blood group (14%).Similar results were observed in study conducted by Shireen Jawed et al. [9] Many studies have shown prevalence of obesity in blood group O. [10-13] In Chandra T et al study blood group B was the most common blood group associated with obesity. [14] Jafari E et al study showed prevalence of obesity in blood group A. [7] Some studies did not show any association between blood groups and obesity. [7,8,15,16] In our study Rh factor was positive in 374(24.70%) overweight and 426(28.13%) obese individuals. Similar findings were observed in other studies. [9,11,14] The limitations of our study included a single gender (males), small sample size as well as lack of data on Rhesus negative blood groups owing to the rarity of these donors.

CONCLUSION

This study showed that more obese and overweight individuals were belonged to blood group 0 and fewer patients were in blood group AB. The finding of obesity and blood group associations gives clue that there may be significant physiological differences among individuals of various blood types. They may be of clinical significance and more case control studies are needed to give high level of evidence to confirm this association in order to establish the need to be more aggressive in risk factor control in these individuals. More population based studies with large sample size needed in future; various geographical areas and populations should be considered.

REFERENCES

1. Ahirwar R, Mondal PR. Prevalence of obesity in India: A systematic review. Diabetes & Metabolic Syndrome: Clinical Research & Reviews.2019; 13: 318-321.
2. Behera S, Sahoo A, Satyanarayana P. Relationship of blood group with body fat percentage, visceral fat, and waist-hip ratio. Natl J Physiol Pharm Pharmacol. 2016; 6(6): 591–595.
3. Sukalingam K, Ganesan K. Rhesus blood groups associated with risk to obesity and diabetes mellitus: A report on Punjabi population in Selangor, Malaysia. Int J Intg Med Sci. 2015; 2(4): 105–109.
4. Qunq YA. Abdel Hamid AZ. ABO blood group associations with obesity in random samples from Advanced Medical and Dental Institute staff and students. Biohealth Science Bulletin. 2012; 4(1): 18–23.
5. Ainee A, Hussain S, Kauser T, et al. Studies on Comparison of Body Mass Index (BMI) of School Going Children Having Different Blood Groups (A, B, Ab and O) of Sargodha District. Pakistan J Nutr. 2014; 13(3): 164–167.
6. Krishnakanth GS, Lad UP, Satyanarayama P. Correlation between obesity and ABO blood group in school going children in India. Indian J Basic Applied Med Bes. 2012; 1(4): 280–284.
7. Jafari E, Sebghatollahi V, Kolahdoozan S, et al. Body Mass Index and ABO Blood Groups among different ethnicities of the Golestan Cohort Study Subjects. Govaresh. 2012; 17(1):50–54.
8. Mascie-Taylor CG, Lasker GW. Lack of an association between ABO and Rh blood group polymorphisms and stature, body weight, and BMI in a cohort of British women. Hum Biol. 1990; 62(4): 573–576.
9. Jawed S, Atta K, Tariq S, Amir F. How good is the obesity associated with blood groups in a cohort of female university going students? Pak J Med Sci. 2018;34(2): 452-456.
10. Jadhav LR, Tejaswini KS, Devi MLR. A relationship between BMI and blood pressure among first year MBBS students of Mysore medical college and research institute. JEBMH 2015;2(10):1478-1484.

11. Aboel-Fetoh NM, Alanazi AR, Alanazi AS, et al. ABO blood groups and risk for obesity in Arar, Northern Saudi Arabia. The Journal of the Egyptian Public Health Association 2016;91(4):169-173.
12. Khan MS, Farooq N, Qamar N, Tahir F, Subhan F, Kazi BM, et al. Trend of blood groups and Rh Factor in the twin cities of Rawalpindi and Islamabad. J Pak Med Assoc.2006;56(7):299-302.
13. Khan MN, Khaliq I, Bakhsh A, Akhtar MS, Amin-ud-Din M. Distribution of ABO and Rh D Blood Groups in the Population of Poonch District, Azad Jammu and Kashmir. East Mediterr Heal J. 2009;15(3):717–721.
14. Chandra T, Gupta A. Association and Distribution of Hypertension, Obesity and ABO Blood groups in Blood Donors. Iran J Pediatr Hematol Oncol. Shahid Sadoughi Med Sci Health Services. 2012;2(4):140–145.
15. Kelso AJ, Maggi W, Beals KL. Body weight and ABO blood types: are AB females heavier? American Journal of Human Biology 1994;6(3):385-387.
16. Smith S, Okai I, Abaidoo CS, Acheampong E. Association of ABO Blood Group and Body Mass Index: A Cross-Sectional Study from a Ghanaian Population. J Nutr Metab. 2018;2018:8050152.

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