



Cover Page



ASSOCIATION OF ABO BLOOD GROUPS IN OBESE SUBJECTS OF HYDERABAD CITY

¹Persis Myrtle D, ²Hannah Jessie Francis T and ³Shiva Prakash M

^{1&2}St. Ann's College for Women and ³Former Scientist, ICMR- National Institute of Nutrition

^{1&2}Mehdipatnam and ³Jamai Osmania P.O., Tarnaka

Hyderabad, Telangana, India

INTRODUCTION

There are studies claiming relation of ABO blood groups to overweight and obesity. Some studies concluded that there was no association between development of obesity and a particular blood group (1). Some studies concluded that there was no association between development of obesity and a particular blood group (2). However further research was in contradiction on the association of ABO and obesity. Therefore, it appears to rule out possible that the ABO blood group system plays a role in determining an individual's susceptibility to certain diseases (3).

The established of association between blood types and disease has been translated into the basis for a range of diets. Of the many authors of blood type diets D'Adamo (1996) (4) is arguably the most prolific within his initial ABO blood type diet book entitled 'Eat Right 4 Your Type' which was published by D'Adamo claims that each ABO blood type processes food differently, and adherence to a diet specific to an individual's ABO blood group could improve health, wellbeing, and energy levels reduce risk of developing diseases such as cancer and cardiovascular disease.

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 for 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.

This is more important in the present scenario because the prevalence of overweight and obesity is on the rise and has now escalated into developing countries like India. The Body mass index (BMI), which is widely used marker of obesity, has been studied with ABO system to find out the potential risk of a particular ABO antigen and propensity for increased body fatness. Diets that are based on a person's blood type have been supported by doctors, including the naturopaths. There is scanty information on scientifically publications data with the type of diet in relation to ABO Blood groups. Most of the literature available is based on popular articles published in magazines on the Internet.

Keeping this background information, the present study was undertaken, to assess the distribution of ABO blood group and Rh typing in overweight and obese individuals to obtain information on their relationship with overweight and obesity.

METHODOLOGY

1) Selection of Subjects

A total of about 205 subjects were randomly selected in this study from Hyderabad city and they were grouped into males (92) and females (113) were included. Further their BMI was calculated based on their height and weight and the selected subjects were undergone for ABO blood group typing using Anti sera(s) for A, B and Rh factor.

2) Laboratory Investigations

ABO typing was done by classic (antigen x antibody agglutination test) method of using glass slides. Aseptic measures were ensured and blood was taken by finger pricking with sterile lancet. Three clean slides were labeled as "A", "B" and "D" followed by placing drops of blood over them. Anti-sera A, Anti-sera-B and Anti-sera D were added on each slide and mixed with blood properly. The agglutination reaction was observed to check blood groups. The data obtained on the blood groups were entered into Excel sheet and appropriate statistical analysis was carried out using computer software, SPSS version 20.0.

RESULTS AND DISCUSSION

A total of about 205 subjects were randomly selected from different areas of Hyderabad city. All the details of their present and past clinical history were recorded on a specially designed questionnaire. The main parameters include anthropological viz. age, sex, height, weight, Body Mass Index (BMI) their present occupation, food/dietary habits were all noted and nutritional counseling was also given. All the individuals have come forward to know their Blood Group status. Some of them despite knowing their Blood Group & Rh factor have been tested as they were interested in participation in the study for reconfirmation of their blood group status.



After performing the Blood group status, the subjects were categorized accordingly and tabulated on to (Table-1). It can be observed that Blood Group ‘O’ were highest in number i.e., 76 (37.07%) followed by ‘B’ with 73 no’s (35.6%), ‘A’ with 44 (21.46%) and ‘AB’ were least in number with 12 (5.8%). When correlated with their mean weights and individual Blood Groups, their mean percentages ranged from 76.65 +/- 1.15 to 72.72 +/- 1.33 with low statistical difference. Similar results were observed with respect to Height and BMI. The data obtained on Blood Groups were also correlated with normal BMI i.e., 18 to 24.9 which is shown (Table-2) that O-Group people has highest with 9.2 % followed by A & B surprisingly AB-Group were zero (0%) may be because that there are no normal weight individuals in this group. On the contrary there was 45.45% followed by 33.3% of AB (again may be because of low numbers) followed by both O and B-Groups recorded and next highest were with similar percentages (32.9%) with respect to overweight (BMI 25-28) indicating weight has prominent role with blood groups.

The most important parameter i.e., obesity with BMI (28-30) and above indicated highest with 66.7% ‘AB’ followed by ‘B’ (61.6 %), ‘O’ 57.9% and ‘A’ group as 45.45%. (Table-3)Therefore it can be clearly observed that B & O groups have close relation with obesity. Our results are in conformity with many other studies, which have supported a number of associations between ABO blood type and certain diseases. Regarding the frequency of ABO blood groups among the overweight and obese patients, Hiwa Omer et.al (2019) (3)reported that blood group O was the most common (n = 361, 40.80%), as it is in the population sample (n = 7563, 37.80%). ABO blood groups among the overweight and obese patients with group O which was the most common (n = 361, 40.80%) in their study had higher population in numbers (n = 7563, 37.80%).

Jayakumar Papanna and Shruthi (2019) (5) reported that 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%). This study showed that more obese and overweight individuals belonged to blood group O and fewer patients were in blood group AB. These findings suggest that ABO blood type might have role in determining body composition. This information will be helpful in recognition of the participants at the risk of obesity with or without co-morbidities on the basis of their blood groups.

Turki Alwasaidiet.al, (2017) (6)have reported ABO blood groups to be associated with different diseases. Very few studies have attempted to detect the association of ABO blood groups with obesity children 13 were having O blood group, 7 were with B blood group and 3 were having A blood group in a study on high school children where more prevalence in girls than in boys.

Overall Obesity and overweight was found more prevalent in O blood group children (7). Further JiheelM.Jadwa. (2010) (8) reported O group was the mostly overweight, followed by A, B, and AB, and only 4% in the O group. Amiya Sarkar and Srila Ghosh Chowdhury(2019) (9) have revealed in their study that AB Rh (-) group was associated with highest mean of BMI value (mean: 25.95). It is suggested that seafarers with AB Rh (-) blood group, had highest mean BMI values, wherein it was cautioned to pay special attention to their weight. Further, there was a significant difference between healthy subjects and obesity with diabetic patients in blood group B and Rh-positive groups (Table-4). It can be noted that the B blood group donors was more susceptible to hypertension and obesity as reported by A Chandra T, Gupta A and Ashish Gupta (2012) (10)

CONCLUSION

This study revealed that obesity and overweight are linked especially with blood groups ‘O’ followed by ‘B’. They are most vulnerable for co-morbidities and their risk of development of both Non-Communicable Diseases (NCD) and Communicable Diseases. The study also disclosed that blood groups along with Rh+ve or -ve are closely associated with obesity and/ or overweight. Therefore, appropriate diets can be formulated through nutrition counseling so that these individuals can be protected or prevented from chronic morbidities.

ABO blood group further reveals the dietary habits of our ancestors and adherence to a diet specific to one's blood group can improve health and tend to decrease risk of chronic diseases such as Diabetes Mellitus, Cardiovascular Disease and Rheumatoid Arthritis etc. It can be claimed that the foods that are eaten regularly react chemically with our blood type.

If we follow a diet well designed for our blood type, our body can digest food more efficiently so that one can lose weight, which, help to prevent susceptibility to disease(s) with strong immunity. Therefore, more number of such studies are required to be carried out especially in India as different regions or states have their own food culture. Hence this will help us to know the relationship with ABO blood groups and diet as it is mandatory to include blood group typing during the nutrition\dietary counseling of subjects with under or over nutrition.



Cover Page



Table- 1: Distribution on Males and Females with respect to BMI.

Total n=205	Male	Female	P-value
No. of Subjects (n)	92	113	
Percentage (% n)	44.9	55.1	
Weight (Kg)	77.58 ±1.08	73.42± 0.91	0.003
Height (m ²)	2.76 ± 0.03	2.57 ±0.02	0.000
BMI (Kg/ m ²)	28.29±0.43	28.65± 0.37	0.515

*The above table shows that a total of 206 subjects over further divided into males (92) and females (113). The mean values of weight in the males were about 77.58 and females were recorded as 73.42. Simultaneously with regard to height 2.76 ± 0.03 of males and 2.57 ±0.02 of females and the BMI was recorded as 28.29±0.43 of males and 28.65± 0.37 of females.

Table-2: Showing correlation of ABO Blood with various parameters weight, Height and BMI of subjects under study.

Total n=205	A-Group	B-Group	AB-Group	O-Group	P-value
No. of Subjects (n)	44	73	12	76	
Percentage (% n)	21.46	35.6	5.8	37.07	
Weight (Kg)	72.72± 1.33	76.65± 1.15	72.0± 2.54	75.96± 1.28	0.043
Height (m ²)	2.66± 0.045	2.65± 0.032	2.62± 0.071	2.65± 0.028	0.708
BMI (Kg/ m ²)	27.40± 0.45	29.01± 0.48	27.66± 1.37	28.75± 0.48	0.034

*The ABO blood groups were categorized as A, B, AB, O groups. The 'B' group recorded highest values with respect to BMI followed by O, A and AB group

Table – 3: ABO Blood Groups correlated with Body Mass Index

Total n=205	A-Group	B-Group	AB-Group	O-Group
No. of Subjects(n)	44 (100 %)	73(100 %)	12(100 %)	76(100 %)
Normal	4 (9.1 %)	4(5.5 %)	0(0%)	7(9.2 %)
Overweight	20 (45.45 %)	24(32.9 %)	4 (33.3 %)	25(32.9 %)
Obese	20(45.45%)	45(61.6 %)	8 (66.7 %)	44(57.9 %)

*The B group showed highest percentage with respect to BMI followed by O, A and AB groups

Table – 4: Relation of Rh +/- factor with various parameters under study

Total n=206	Rh +ve	Rh -ve	P-value
No. of Subjects (n)	178	27	
Percentage (% n)	86.8	13.2	
Weight (Kg)	75.39± 0.78	74.51 ± 1.68	0.677
Height (m ²)	2.64 ± 0.02	2.69 ± 0.05	0.400
BMI (Kg/ m ²)	28.60 ± 0.30	27.76 ± 0.63	0.301

* The Rh+ factor was recorded with BMI of 28.60±0.30 followed by Rh- with mean value of 27.76 ± 0.63.



Cover Page



REFERENCES

1. Siddiqui NI¹, Soni A²,Khan SA³,30 Aug 2019, Association of ABO blood types and novel obesity markers in healthy adolescentJournal of Education and Health Promotion, 8:153
2. AmerAlmaimanElsayed I ElagamyOsama Al WutaydMohammedAlmarzuqi, January 2020, Association of Obesity with ABO Blood Groups in Blood Donors International Medical Journal (1994) 25(1):235-242.
3. Hiwa Omer Ahmed ^aShwanAliTawfiq^bDaraAhmedMohammed^c,March 2019,Association of ABO group types to overweight and obesity: Based on six years of experience in two centers in Suleiman governorate, Kurdistan Region/Iraq Obesity MedicineVolume 13, Pages 21-25.
4. D'Adamo (1996). Eat Right for Your Type book as published.
5. Jayakumar Papanna1 Shruthi Bettegowda2, July-September 2019, ABO Blood Groups and Risk for Obesity: A Retrospective Study from Rural Tertiary Care Hospital of South Karnataka Jayakumar Papanna1, Galore International Journal of Health Sciences and Research Vol.4.3.
6. Turki A. Alwasaidi, FRCPC a,* , Sarah K. Alrasheed b , Rahaf A. Alhazmi b , Omar B. Alfraidy b , Mohammed A. Jameel b and Akram A. Alandijani , 2017, Relation between ABO blood groups and obesity in a Saudi Arabian population Journal of Taibah University MedicalSciences Volume 12, Issue 5, October Pages 407-411
7. G V Siva Krishnakanth Umesh PralhadraoLad..P Satyanarayana, September 2012, Correlation between obesity & ABO Blood Group in School going Children in India.” Indian Journal of Basic & Applied Medical Research; Vol.-1, Issue: 4, P. 280-284 280
8. JiheelM.Jadwa. The Correlation between obesity & ABO Blood Group of a sample of students of the Faculty of Education at the University of Wasit DJSE,Voloum(2), Issue (1) Abstract 38.
9. Amiya Sarkar, Srila Ghosh Chowdhury. “A Study of Relation between ABO, RH Blood Groups and Obesity in Eastern Part of India.” IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 7, 2019, pp 18-22.
10. Chandra, T., & Gupta, A. (2012). Frequency of ABO and rhesus blood groups in blood donors. Asian journal of transfusion science, 6(1), 52–53. <https://doi.org/10.4103/0973-6247.95057>.