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Study the Correlated Between Human Blood Groups and Body Mass Index for Children in Thi-Qar Province

Qater Al-nada Ali Kanaem AL-Ibady

College of Health and Medical Technology / Middle Technical University /Medical laboratory Technology

Abstract

In this study shows that blood specimens were collected from 54 individuals (32 males and 22 females). They were attending in Al-Mossawey hospital for children in Thi-Qar province, and who agreed to participates in this study. These data were collected during the period from 19 Augest 2013 to 17 septemper 2013 . Also these data collected through direct interview of patients , and in the form of a special questionnaires designed for the purpose of study. Therefore , the present study recorded a high significant differences for the blood group B^+. It was the number of his 21 from 54 individuals and the percentage 38.39%, who living in the urban area and which were 72.22%. And from the males which were the percentage 59.26%, and also recorded a high significant differences. Also this study demonstrated a highly significant differences for the relationship between blood groups systems and different infection with diseases , and which were 79.63%. While the relationship between blood groups systems and the infection with parasites was no significant . Also the harvest of this study from the results of effect each of the gender , the residence and blood groups systems on body mass index (BMI) were not significant . But the correlation coefficient between body mass index with variable correlated , such as (BMI) and age , (BMI) and body weight and the correlated between the age and body weight , recorded a highly significant differences ($P<0.01$) , therefor ther were 0.42 , o.66 and 0.84 on respectively.

Key Words : Blood Groups Systems , Infection with diseases , Residence , Body Weight , Age , Gender , Body Mass Index (BMI) , Environmental conditions.

Introduction

The word (blood group) back to the all blood groups system comprising red blood corpuseles (RBC) antigens whose specificity is controlled by a series of genes which can be allelic or linked very closely on the same chromosome . But, the word of (blood type) back to the certain style of reaction to testing antisera within existing system . After this peried, the previously known on the systems of blood groups include not only transfusion-related problems. Also, specific diseases linked with antigens which found on the surface of (RBC) [1] . Found about (33)) blood group system representing more than (300) antigens immune are listing by the International Society of blood transfusion [2]. Therefore, the (ABO) blood groups systems can classification of blood based on the structural variation of a certain carbohydrate antigens immune on the red blood corpuseles [3]. Also, the (ABO) blood groups are the most important blood type systems in human blood transfusion . Therefore, linked the anti-A and anti-B antibodies are generally IgM antibodies, which are usually produced in the first years of the life by healthy improvement to environmental substances such as the quality of food, bacteria, and viruses. (ABO) blood types are also present in some other animals, such

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as chimpanzees, bonobos, and gorillas [4]. Then, the frequencies numbers of blood groups systems (A) and (B) differ between the populations, were the differences to result of random genetic deviation and founder effects, until in small populations which later multiplied and stabilized the original, the chance, repetitions, or were the result of natural selection, arising from differences in the physical fitness between the different blood groups systems . Therefore, the physical finesses which themselves depended upon locally determined landmarks of the external environmental variables [5]. Therefore, the aim of this study is to estimation the percentage of blood groups system in different location(Urban and Rural) in Thiqar province, also to compare the effect of blood groups systems in biomass index. And to diagnosis the diseases and worms whose infected with it.After that to detect the correlation coefficient between biomass index with age and body weight.

Materials and Methods

Fifty four (54) patients enrolled in this study have been regularely selected (from age 4-12year) who visited in the al-mossawey hospital for children in Thi-qar province during the period between (19 Augest-17 Septemper - 2013). Body Mass Index estimated beside the blood groups and type, quantity of their foods.

Aquestionaire have been prepared which included all the essential informations by followed:

1.Patient Name:

2.Age: ☐ year

3.Sex : male ☐ female: ☐

4.Blood group: O+,O-,A+,A-,B+,B-,AB+,AB-

5.Length:cm

6.Weight:kg

7.Residence : Rural ☐ Urban ☐

8.Having disease

9.Having worms

10. Body Mass Index (BMI)= (weight in Kg)/((Height in meter)2

Materials

1.Antigen A,B and D (Rh)

2.Glass Slides

3.Capillary tubes

4.Lancets

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5.Sticks (wooden stick)

6.Cotton

7.Balanc for measuring of weight by Kg

8.Meter for measuring of high or length by cm

Statistical Analysis

The statistical Analysis System-SAS (2010) [6], was used to effect of different factors in parameters .Chi-square test was used to significant compare between percentage in this study.

The Results

The table (1) showed distributed of samples according to gender, whereas the percentage of males higher than the females, which were 59.26% from total, samples 54. The chi-square value were 7.25 under $p< 0.01$, then found high significant differences between genders to the blood groups systems, also the table (2) detection the highly significant differences under $p< 0.01$ for distribution the children according to blood groups system, because the highest percentage recorded for B+ and O+, which were in respectively 38.89% and 33.33%. While the table (3) demonstrated the highest significant differences $p< 0.01$ for distribution the children according to the residence , therefore the higher percentage which recorded to urban areas , which were 72.22% comparison with rural areas , which were 27.78 , while the table (4) demonstrated to distribution of samples according to infected with parasites. This table recorded no significant difference between the blood groups systems, and infected with parasite , in this way the yield of effected with age in body mass index were non-significant differences table (5). But the table (6) showed distribution of samples according to infection with differences of diseases, the highest percentage which refers to children who's infected with diseases, which were 79.63%, this detection to highly significance differences $p< 0.01$ for the relationship between the blood groups systems and infected with diseases. While the harvest of effected gender in biomass index (BMI) was non-significant differences table (7). So the table (8) demonstrated the effect of residence in biomass index, the result were non-significant too. The table (9) showed the effect of blood groups systems with biomass index, hence the relationship was non-significant, but the correlation coefficient between bio mass index with both age and body weight were highly significant $p< 0.01$,Table(10).

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Table (1): Distribution the samples (No. and percentage) according to gender

Gender	No.	Percentage (%)
Male	32	59.26
Female	22	40.74
Total	54	100
Chi-square value	---	7.255**
) **P<0.01(		

Table (2): Distribution the samples (No. and percentage) according to the blood group

Blood group	No.	Percentage (%)
A^+	11	20.37
B^+	21	38.89
O^+	18	33.33
AB^+	3	5.56
O^-	1	2.86
Total	54	100
Chi-square value	---	
) **P<0.01(		

Table (3): Distribution the samples (No. and percentage) according to the location (residence)

Location (residence)	No.	Percentage (%)
Urban	39	72.22
Rural	15	27.78
Total	54	100
Chi-square value	---	** 10.782
) **P<0.01(		

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Table(4): Distribution the samples according to the infected with parasites

Infected with parasites	No.	Percentage (%)
Yes	27	50.00
No	27	50.00
Total	54	100
Chi-square value	---	NS 0.00
NS: Non-significant		

Table (5): Distribution the samples (No. and percentage) according to the infected with different diseases

Infected with diseases	No.	Percentage (%)
Yes	43	79.63
No	11	20.37
Total	54	100
Chi-square value	---	11.375**
) **P<0.01(		

Table (6): Effect of gender in BMI

Gender	No.	Mean
Male	32	0.00156
Female	22	0.00148
Total	54	---
T-test	---	NS 0.00023
NS: Non-significant		

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. Table (7): Effect of blood group in BMI

Blood group	No.	Mean ± SE
A^+	11	0.0048
B^+	21	0.0051
O^+	18	0.0046
AB^+	3	0.0052
O^-	1	0.0051
Total	54	---
LSD Value	---	NS 0.00022
NS: Non-significant		

Table (8): Correlation coefficient between BMI and age and body weight

Variable correlated	Correlation coefficient (r)	Variable correlated
BMI and Age	0.42	BMI and Age
BMI and Body wight	0.66	BMI and Body wight
BMI and Body wight	0.84	BMI and Body wight
) **P<0.01(		

Discussion

The demographical distribution of data showed that most blood group samples collected from males which were 59.26%, but the other for females, which were 40.74% from total 54 samples. This result disagrees with [7], when they found 20.897 were female and 7.231 were males.Also this result disagrees with [8],when they found no significant difference between the gender.This may be refers to the certain distribution of population and interplay between the genetics and environmental conditions[9].The results can demonstrated the blood system groups B^+ and O^+ were the most common of the ABO blood groups systems in the population studied,which were 38.89% and 33.33% in respectively. But the O^- blood group was quite rare as number and percentage,which were 2.86%.The results of this study agrees with study of [10], when found blood group B (37.86%) followed by blood group O (28.57%).While this results disagreement with[11],

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when they found that phenotype O was the most common frequently group system, while the group system AB records the lowest percentage in the whole samples .The O, B, A and AB blood groups system percentages, were the follows: 35.4% , 33.2% , 22.5% and 8.7% in the respectively.Therefore this results refers to the a high factor gene frequencies for B^+ and O^+ blood groups systems for children in Thi-Qar province, also this result agreement with a high population which recorded a high frequency of B^+ and O^+blood groups systems than very low number and percentage which recorded for O^- blood group system[11].This study recorded a highly percentage for urban 72.22% than the rural 27.78%., this resut may be refers to most of patients were from nearby areas.This result disagreement with [12], when they recorded highly number and percentage of O,A,B and AB in rural areas, which were in respectly 20.2,80.5,79.4 and 80.1.Also this study showed no significant in relationship between ABO blood groups and infection with parasites.Then this result agreement with [13], when they found there was no significant relationship between ABO blood groups and malaria in our population, this could be due to various demographic reasons.Although there are no significant between the gender and ABO blood groups system.This result disagreement with [14], when they found there was an association between distribution of fingerprint patterns, blood group and gender in Maiduguri and thus prediction of the gender and the blood group of a person is possible based on fingerprint pattern.Overall, this study recorded no significant between the body mass index (BMI) and ABO blood group systems.Therefore this result disagreement with [15], when they found the relationship between the ABO blood groups systems and the BMI at the first menarche and hypertension are not singly risk factors for infected with breast cancer, but probably combination of them can increases breast cancer incidence.Besides, this study showed , there are relationship between the ABO blood groups systems and infected with diseases.Therefore this result disagreement with [16],when the auther found a higher percentage of patients belonging to the blood group A infected by *Trichophyton rubrum*, therefore these results suggest that there is no significant or statistical evidence that these individuals are more susceptible to dermatophytosis.Also there were found no significant between the gender and the body mass index in this study. This result disagreement with [17], they found a significant positive correlation was observed between BMI-BF%, in the males were (r =0.75, $p < 0.01$; SEE = 4.17) and in the females were (r = 0.82, $p < 0.01$; SEE = 3.54) of all ages groups. Effect of age groups and the gender in the BMI-BF% relationship was significant ($p < 0.001$), with more effect from gender.But this study demonstrated high significant for the Correlation coefficient between BMI and age and body weight. Then these resultes agreement with [17], when the authers found the BMI strongly correlate with BF % estimated by bioelectrical impedance, in this sub population of South Asian from adults. This relationship was curvilinear in nature and was significantly influenced by the age groups and the gender. Our findings support the importance of taking age and gender in to consideration when using BMI to predict body fat percentage/obesity, in a population.These resultes refers to the body mass index BMI significantly correlated with body fat percentage estimated by bioelectrical impedance analysis. Also the BMI was significantly influenced by age, gender, body muscle , body water and the time of physical development , because of occures changes in the body's hormones. Also the sexual maturation and body growth all which may potentially affect on the body composition like body muscle and body fat , also body water across age and gender [18].

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References

[1] Owen R. Karl Landsteiner and the first human marker locus. Genetics. 2000; 155:995

[2] Lögdberg L, Reid ME, Zelinski T. Human blood group genes 2010: Chromosomal locations and cloning strategies revisited. Transfuse Med Rev. 2011; 25:36–46.

[3] Ghazarian H.; Idoni; B. Oppenheimer S.B.2011. A glycobiology review: carbohydrates, lectins and implications in cancer therapeutics. Acta Histochem.1 (13):236-247.

[4] Maton, Anthea; Jean Hopkins, Charles William McLaughlin, Susan Johnson, Maryanna Quon Warner, David La Hart, Jill D. Wright (1993). Human Biology and Health. Englewood Cliffs, New Jersey, USA: Prentice Hall. ISBN 0-13-981176-1.

[5] Anstee David. J. The relationship between blood groups and disease. 2010; Blood, 115(23): 4635 – 4643.

[6] SAS. 2010. Statistical Analysis System, User's Guide. Statistical. Version 9.1th ed. SAS. Inst. Inc. Cary. N.C. USA.

[7] Mengoli, Carlo; Bonfanti, Carlo; Rossi, Chiara and Franchini, Massimo. Blood group distribution and life-expectancy: a single-centre experience. Blood Transfus. 2015; 13(2): 313–317.

[8] Odokuma,E.I. ; Okolo,A.C. and Aloamaka,P.C.Distribution of ABO and Rhesus blood groups in Abraka , Delta State. Nigerian Journal of Physiological Sciences 22 (1-2): 89-91, ©Physiological Society of Nigeria, 2007.

[9] Musa, A.U.; Ndakotsu, M.A.;Abdul-Aziz,H. ; Kilishi,A. and Aliyu,I. Distribution of ABO and Rhesus blood group among blood donors in Soko to North-Western Nigeria.J.Appl.Hematol.2015,6(3):136-138.

[10] Deopa, D.; Prakash. and Tayal,I. A Study of Fingerprint in Relation to Gender and Blood Group among Medical Students in Uttarakhand Region. J Indian Acad Forensic Med. January-March 2014, 36(1):23-27.

[11] Mouhaus, H. A.; Abbas, S. H.; Musa, A. S. and Mahawi, H. K. A study of ABO blood group and Rhesus factor distribution among sample of Missan province population. Journal of Basrah Researches ((Sciences)), 36(5), 2010:48-53.

[12] Etemadi, Arash; Kamangar, Farin; Islami, Farhad; Poustchi, Hossein; Pourshams, Akram; Brennan, Pau; Boffetta, Paolo; Malekzadeh, Reza; Dawsey, Sanford M. ; Abnet, Christian C. and Emadi, Ashkan. Mortality and cancer in relation to ABO blood group phenotypes in the Golestan Cohort Study. BMC Medicine (2015) 13(8):2-7.

[13] Gayathri, B.N. ; Harendra Kumar, M.L.; Gomathi, N.; Jeevan, Shetty and Reethesh, R. P. Relationship between ABO blood groups and malaria with clinical outcome in rural area of South India. GLOBAL JOURNAL OF MEDICINE AND PUBLIC HEALTH, 2013; 2(1):1-7.

[14] Ekanem, A.U. ; Abubakar, H. and Dibal, N. I. A Study of Fingerprints in Relation to Gender and Blood Group among Residents of Maiduguri, Nigeria. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)2014, 13(8),Ver. III: 18-20.

Print ISSN: 2073-8854 & Online ISSN: 2311-6544

[15] Payandeh,M.; Shazad,B.; Sadeghi,M.; Bahari,N. and Sadeghi,E. Association between of BMI and Blood Groups with Breast Cancer Incidence among Women of West Iran: A Case-control Study. American Journal of Cancer Prevention. 3 (3), 2015: 65-67.

[16] VILANI-MORENO, Fátima Regina; Parreira de ARRUDA, Maria Sueli; CLARO, Simone Guadgnucci; Camarinha MARCOS, Elaine Valim and URA, Somei._Dermatophytosis: association between ABO blood groups and reactivity to the trichophytin. Rev. Inst. Med. trop. S. Paulo,1999;41(5):

[17] Ranasinghe, Chathuranga; Gamage, Prasanna; Katulanda, Prasad; Andraweera, Nalinda; Thilakarathne, Sithira and Tharanga, Praveen. Relationship between Body mass index (BMI) and body fat percentage, estimated by bioelectrical impedance, in a group of Sri Lankan adults: a cross sectional study. BMC Public Health, **2013; 13(797):1-8.**

[18] Ifeoma, F. Odo, Lawrence, U. S. Ezeanyika and Nene, Uchendu. The Relationship among Body Composition and Body Mass index in a Population of Adolescents in Enugu State, Nigeria. Int.J.Curr.Microbiol.App.Sci, (2015); 4(1): 884-897.