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Prevalence Study of the Blood Groups and Their Rhesus Groups in Some Western Coast Regions - Libya

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دراسة انتشار فصائل الدم وفصائل الريسوس الخاصة بها في بعض مناطق الساحل الغربي - ليبيا

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Abstract:
Determination of blood groups of the ABO system and Rhesus (Rh) groups has significant impact on people health during blood transfusion. Therefore, understanding the prevalence of blood group in a particular area is important to know any shortages of any blood group particularly during disasters. To Study the prevalence of blood groups of the ABO system and Rh groups in in West Coast regions (Regdalin, Aljmail and Zaltan- Libya, the ABO and Rh systems were determined by presence of antigen A and antigen-B for the ABO system and antigen D for Rh groups on erythrocytes. Which, detected by agglutination on the slide when mixed drops of blood with specialized sera to enable us for identification the most common and lowest blood groups and their Rh among the donors in the study regions. Among the 354 of examined samples (i.e., 354 persons), we found that percentage of blood groups as following: In Ragdalin; (O+) was 41.3%, (A+) was 28.6%, (AB+) was 7.4%, (O –) was 6.9%, (B+) was 6.8%, (A–) was 4.3%, (AB–) was 3.2% and (B–) was 1.6%. While, in Al jmile; (A+) was 29.3%, (O+) was 27.3%, (AB+) was 16%, (B+) was 10.3%, (A–) was 7.5%, (AB–) was 4.7%, (O–) was 3.7% and (B–) was 0.9%. Whereas, In Zaltan; (O+) was 32.3%, (A+) was 27.1%, (AB+) was 10.2% = (A–) was 10.2%, (B–) was 6.8%, (B+) was 5.7%, (O–) was 5.7% and (AB–) was 3.4%. This finding reveled that positive Rh of (O) blood group was the most common, followed by (A) group, (AB) group, and (B) blood group; negative Rh blood groups were the lowest. The outcomes of this study are important to identify donors and their blood (ABO) system in the region, to establish blood donation database which would be used to build up blood bank, in addition to call them in case of emergency need of blood donation.

Keywords: Blood groups (ABO) System (A, B, AB and O), Rhesus groups, Blood donation, Libya.

الملخص
إن تحديد فصائل الدم من نظام ABO وفصيلة الدم Rh له تأثير كبير على صحة الأشخاص أثناء نقل الدم. لذلك، فإن فهم انتشار فصيلة الدم في منطقة معينة أمر مهم لمعرفة أي نقص في أي فصيلة دم خاصة أثناء الكوارث. لدراسة انتشار فصائل الدم من نظام ABO ومجموعات Rh في مناطق الساحل الغربي (رقدالين والجميل وزلطن - ليبيا) تم تحديد أنظمة ABO وRh من خلال وجود المستضد A والمستضد B لنظام ABO والمستضد D لمجموعات Rh على كريات الدم الحمراء.

والذي تم الكشف عنه عن طريق التكتل على الشريحة عند خلط قطرات الدم مع مصل متخصص لتمكيننا من تحديد فصائل الدم الأكثر شيوعًا والأقل وRh الخاصة بها بين الاشخاص في مناطق الدراسة. من بين 354 عينة تم فحصها (أي 354 شخصًا) وجدنا أن نسبة فصائل الدم على النحو التالي: في رقدالين؛ (O +) كانت 41.3٪، (A +) كانت 28.6٪، (AB +) كانت 7.4٪، (O —) كانت 6.9٪، (B +) كانت 6.8٪، (A —) كانت 4.3٪، (AB —) كانت 3.2% و(B—) كانت 1.6%، أما في الجميل فكانت (A+) كانت 29.3 % و(O +) كانت 27.3 % و(AB+) كانت 16% و(B+) كانت 10.3% و(A—) كانت 7.5% و(AB —) كانت 4.7% و(O —) كانت 3.7% و(B—) كانت 0.9% ، أما في الزلطن فكانت (O+) كانت 32.3% و(A+) كانت 27.1% و(AB+) كانت 10.2% = (A—) كانت 10.2% و(B—) كانت 6.8% و(B+) كانت 5.7% و(O—) كانت 5.7% و(AB—) كانت 3.4%. وقد كشفت هذه النتيجة أن فصائل الدم الموجبة (O) هي الأكثر شيوعاً، تليها فصائل الدم (A) و(AB) و(B)، في حين كانت فصائل الدم السالبة (Rh) هي الأقل شيوعاً. وتكمن أهمية نتائج هذه الدراسة في تحديد المتبرعين ونظام فصائل الدم (ABO) لديهم في المنطقة، وتأسيس قاعدة بيانات للتبرع بالدم والتي يمكن استخدامها لبناء بنك الدم، بالإضافة إلى الاتصال بهم في حالة الحاجة الطارئة للتبرع بالدم.

الكلمات المفتاحية: نظام فصائل الدم (ABO) (A, B, AB, O)، فصائل الدم الريسوس، التبرع بالدم، ليبيا.

Introduction

Currently, more than twenty-eight blood group systems have been recognized, but (ABO) and Rhesus (Rh) systems are the most important (Ananthanarayan, 2013. Kvržić, Z. 2024). Since the first attempt of blood transfusion from one person to another, the blood transfusions were either successful; or unsuccessful and even fatal in some cases. Which was due to the lack of knowledge about blood groups. In 1900, Karl Landsteiner discovered that red blood cells (RBCs) of humans were not all antigenically alike (Aneja, 2003). By this discover, the blood has been classified into (A), (B), and (O) groups. Later on, in 1902, Landesteiner's associates, Von Decastello and Struli discovered the fourth blood group (AB) and reported it into blood groups (ABO) system (Sood, 2009). H-antigen, a precursor on erythrocyte surface, which is responsible for formation of (A) and (B) antigens in the (ABO) blood group system (Ananthanarayan, 2013).

During gestation period, antigens (A), (B) and (H) are manifested early at about 37 days of fetal life but do not increase very much in strength during gestation period. Erythrocytes of newborn infant carry between 25% to 50% of antigenic sites found on adult erythrocytes (Godkar, 2014).

Either (A) or (B) antigen is fully expressed at 2 – 4 years of age and remain constant throughout life (NBTC, 2017). Anti-A and anti-B isoantibodies (Isohemagglutinin) are naturally antibodies appear in the serum without any clear antigenic stimulation (Arora, 2008). Both anti-A and anti-B-isoantibodies appear firstly in serum of infants by the age of 2 – 8 months after birth and concentration of anti-A and anti-B iso-antibodies reach to maximum between 8–10 years of the age, and then they slowly decreased for the rest of person's life (Huni,2014). These antibodies usually IgM type, that known as cold reacting, IgM does not cross placenta and bind complement (Godkar, 2014).

ABO system includes four blood groups and is determined by presence or absence of two distinct antigens (agglutinogen) (A) and (B) which expressed on the surface of the RBCs. The four groups are also distinguished by presences or absence of two distinct isoantibodies (anti A and Anti B) in the serum (Ananthanarayan, 2013).

Blood group (A) expresses antigen (A) by its RBCs and its serum possesses anti-B antibodies (agglutinin). While, blood group (B) expresses antigen (B) by its RBCs and its serum possesses anti-A antibodies, whereas blood group (AB) expresses antigens (A) and (B) on its RBCs and its serum possesses no antibodies, while blood group (O) does not possess antigens (A) nor antigen B on its RBCs and its serum possesses both anti-A and anti-B antibodies (Arora, 2008).

Considering Rh that was discovered by Karl Landsteiner and Wiener in 1940, there are more than 50 antigens in the Rh blood group system, but the principal Rh antigens of medical interest are (D), (C), (E), (c) and (e) (Gundrajukuppam *et al*., 2016). Rh antigen is an integral part of the RBCs membrane; they are protein in nature with an active phospholipid component (NBTC, 2017). Two types of Rh factors are depending on the presence or absence of antigen (D) on RBCs surface which are known as Rh positive, Rh (+) and Rh negative, Rh (-) (Bethesda, 2005).

Regarding to Rh factor, the most important group of patients to be considered is pregnant females. In Rh(-) pregnant women, maternal anti-D antibodies can cross the placenta and destroy positive fetal RBCs, leading to fetal death, for this reason, Rh (-) pregnant women are given an injection of anti-D after giving birth to an Rh (+) baby (NBTC, 2017).

Blood is life fluid, so it is responsible for dynamic of many biological functions, growth and protection of the body. Therefore, identification of (ABO) blood groups types is essential for blood and its derivatives donations, as the blood transfusion applies when there is identical of the blood-donor group

to the blood-recipient group (Harmening and Firestone, 2005). Therefore, available of a donor of identical blood group has a major significance in saving people's live particularly during accidents, surgical operations, pregnancy and others pathological conditions. Furthermore, a link has been demonstrated between the (ABO) blood group and occurrence of many diseases such as cancer (Xie *et al*., 2010) heart diseases (Anstee, 2010) and diabetes mellitus (Bener and Yousafzai, 2014). Thus, understand blood groups might be good tools to study of epidemiology of these diseases.
Information about prevalence of the (ABO) system and Rh factors is an essential step to perform the blood transfusion through a blood bank, so that could save patients during critical conditions. Moreover, establish database for (ABO) groups among residents is crucial in terms of urgent needs of particular blood group. In the western coast regions of Libya, there is a lack of information about the prevalence (ABO) and Rh. Therefore, we aimed to identify blood types (ABO) system and Rh factors in subjected persons to blood group investigation, to determine frequency and distribution (ABO) and Rh blood group patterns, also to determine the rare blood phenotypes and associated Rh factors, and their correlation to age, sex and distribution in these regions.

Sample Collection and Analysis
Over a period of four months from October 2022 to January 2023, 354 blood samples were randomly collected from subjected persons at different ages based upon their consent and request to investigate their blood groups and Rh types. The Rh and blood groups investigations were carried out in the Medical Laboratory at Kimat Attafawok Clinic, Aljmail, Libya. Median cubital vein was punctured to withdrawal 2-3 mL of venous blood samples, which collected into vials contains dipotassium EDTA as an anticoagulant that usually used in (ABO) cell grouping. The slide method for (ABO) blood grouping and Rh group was used. Briefly, anticoagulated venous blood samples were mixed gently by rotation for at least 2 minutes before testing (Dialab, 2020). A clean glass slides were divided into three equal sides using a glass marker, and marked as sides A, B and D. One drop of anti-A serum (blue bottle) was placed on the side A, one drop of anti-B serum (yellow bottle) was placed on the area that marked B and one drop of anti-D serum (white bottle) was placed on the area that marked D. One drop of each blood sample was put near anti-A, drop of the same blood sample was put near anti-B serum and another drop of the same sample was put near anti-D serum. Each drop of the sample then was mixed separately with anti-A, anti-B and anti-D serums using a stick or with the end of a glass slide. All mixtures were left steady for 5 minutes and then investigated for agglutination. Agglutination was visible with naked eyes as dark reddish clumps in different sizes. Agglutination was also confirmed by microscopic examination.

Questionnaire of the subjected persons to (ABO) blood groups and Rhesus group investigation:
A questionnaire was carefully prepared and built-up to determine blood group types (ABO) system, Rh group and their correlation to age, sex and distribution in the study regions.
Interpretation of results
Determination of (ABO) system groups by demonstration of antigens (A) and (B) that expressed by blood agglutination on slide when mixed drop of blood with specialized serum–agglutination on part of antigen (A) that mean blood group is (A). Agglutination on part of antigen (B) that mean blood group is (B). Agglutination on part of antigen (A) and (B) that mean blood group is (AB). If there is no agglutination on part of antigen A nor B on slide when mixed them with anti-A or anti-B serum, it means blood group is (O). Rh group detection by adding anti-D to the blood drop on another part of the slide and if there is agglutination it means Rh is positive otherwise, it is negative.
Statistical Analysis
Obtained data were analyzed using CHI-Square. A statistically significant difference was considered if ($P < 0.05$) was obtained.

Results and Discussion
Out of the total samples size i.e., 354 that examined for identification of blood group types (ABO) system and Rh blood group in all subjected persons based upon gender, age groups and regions of study have been presented inTable.1 and showing that 142 (40.11%) of the participants were male and 212 (59.89%) were female. The distribution of participants age was 106 (29.9%), 150 (42.4%), 61 (17.2%), and 37(10.5%) for the age groups of 12–22, 23–33, 34–44 and 45–55 years, respectively. Regions of study were 189 (53.4%), 106 (29.9%) and 59 (16.7%) for the regions Reqdalin, Aljamil and Zaltan respectively.

Table 1. Shows sex, the age and region of study subjects in West Coast regions (Ragdalin, Aljamail and Zaltan).

Gender	Total number	Percentage
Male	142	40.11%
Female	212	59.89 %
Age groups		
12–22 ys	106	29.9 %
23–33 ys	150	42.4 %
34–44 ys	61	17.2 %
45–55 ys	37	10.5 %
Region		
Reqdalin	189	53.4 %
Aljamil	106	29.9 %
Zaltan	59	16.7%

Identification of blood groups and their Rh groups is a crucial for people life. Particularly, those with the less common blood groups that are required by people in critical circumstances for blood and its derivatives transfusion. In our study, there is the valuable percentage of participants according to age that extend from 34–44 years, (it was 42.4%) and other participants who their ages were ≥ 16 years. According to the World Health Organization (WHO), the permissible age limit for blood donation ranges between 16 years and 65 years, out of this range the WHO does not recommend blood donation, such as in children and elderly since it may lead to anaemia (Mengoli *et al*., 2015). This indicates that a blood donation shortage is less likely to happen in these regions, as most participants are at a preferred age for blood donation and do not mind donating blood. Particularly, if more people are encouraged to donate blood.

Based upon the cities of participants residency (Ragdalin, Aljamail and Zaltan), among 354 of examined people, the distribution of blood groups in Reqdalin region were 62 (32.8%) blood group (A), 16 (8.5%) Blood group (B), 20 (10.6%) Blood group (AB) and 91 (48.15%) blood group (O) (Table 2). This result indicates that in Reqdalin region, the blood group (O) was the most common followed by group (A) then group (AB) whereas blood group (B) was less common.

Table 2: Geographic distribution of blood group among study subjects in West Coast regions (Ragdalin, Aljamail and Zaltan).

Regions	ABO Blood Groups			
	O	A	B	AB
Reqdalin	91 (48.15%)	62 (32.8%)	16 (8.5%)	20 (10.6%)
Al jamile	33 (31.13%)	39 (36.8%)	12 (11.3%)	22 (20.6%)
Zaltan	22 (37.3%)	22 (37.3%)	7 (11.9%)	8 (13.6%)
Total = 354		P = 0.079	(*P* > 0.05)	

Regarding our results in Reqdalin region, Salih et al. (2005) have reported similar distribution of blood group (O) in Ghat city. While, our results of blood group (A) (32.8%) are corresponding with the findings of the study conducted by Saad (2016) and Ghat city study (Salih *et al*. 2005), while the blood group (B) result 8.5% was resembles with the findings of a study conducted by Marion and Christine (2007). These results indicate that the distributions of blood grouping are variable among the different regions and among each blood group, which cannot be predicted.

In Al jamile region, we found that frequency and percentage as blood group (A) was 39 (36.8%), blood group (B) was 12 (11.3%), blood group (AB) was 22 (20.6%) and blood group (O) was the 33 (31.13%). This result indicates that blood group (A) was the most common, followed by group (O), group (AB), and lastly, blood group (B). In Al jamile region, the blood group (O) percentage 31.13% was in corresponds with the findings of the study in Tenenai of Bani Waleed city that conducted by Ameigaal and Ageel (2019), while the other blood groups were not corresponded to Ameigaal and Ageel's study. This indicates that even in close geographical areas there are un-predictable distribution of blood groups

In Zaltan region, we found that frequency and percentage of blood group (A) was 22 (37.3%), blood group (B) was 07 (11.9%), blood group (AB) was 08 (13.6%) and finally, blood group (O) was the 22 (37. 3%). The results of identification of blood groups in Zaltan region study explained both of blood groups (O) and (A) were the same, followed by blood group (AB), and lastly, blood group (B). Blood group (B) has found to be the lowest frequency and percentage blood group in regions of this study.

In the present study's the finding of blood group (A) in the Zaltan region (37.3 %) which was corresponding to the findings of the study conducted by Saad (2016), while the other blood groups do

not correspond to the findings in the same study. In this study, the result of the blood group (B) was 11%, in both of Zaltan and Al jamile region which corresponds to study conducted by Salih *et al*. (2005). Study of distribution of blood groups is important as it plays a vital role in blood transfusion, human evolution, anthropology and tracing ancestral relation of humans. Moreover, some blood groups have shown associations with diseases like duodenal ulcer, diabetes mellitus, urinary tract infection and ABO & Rh incompatibility of newborn (Skaik and El-Zyan. 2006).

In addition to ABO system, the Rh groups system has significant impact on blood transfusion, concerning Rh blood groups and based upon participant's regions of residency, which are presented in table 3 and showing that frequency and percentage of Rh blood groups in Reqdalin region were 159 (84.13%) Rh (+) and 30 (15.87%) Rh (-). Rh group in Aljamile region were 88 (83.02%) Rh (+) and 18 (16.98%) Rh (-). Rh group in Zaltan region were 44 (74.6%) Rh (+) and 15 (25.4%). In this study the Rh group in Al jamile region, was similar with the findings of the study conducted by Saad (2016). It is noticeable that, Rh (+) is more frequent than Rh (-) in all blood groups. Which, similar to the results reported in different countries (Wikipedia contributors, 2024. Özkasap *et. al.,* 2013).

Table 3. Distribution of Rhesus group based upon region for study subjects in West Coast regions (Ragdalin, Aljamail and Zaltan).

Region	Rhesus groups			
	Rh(+)		Rh(-)	
Reqdalin	159	84.13 %	30	15.87%
Aljamile	88	83.02 %	18	16.98%
Zaltan	44	74.6 %	15	25.4%
P = 0.238 (*P* > 0.05)				

Identification of Rh blood group in all subjected persons based upon gender are presented in Table 4 and shows frequency and the percentage of Rh group in male were 127 (89.44%) Rh (+) and 15 (10.56%) Rh (−), while in female were positive 165 (77.83%) Rh (+) and 47 (22.17%) Rh (−). The identification of Rh factor is important during blood transfusion and Rh incompatibility during pregnancy because it causes hemolytic transfusion reaction or hemolytic disease of a newborn when the Rh (-) mother has been sensitized to Rh (+) blood (Bethesda, 2005).

Table 4. Distribution of Rhesus group based upon the Gender of study subjects in West Coast regions (Ragdalin, Aljamail and Zaltan).

Gender	Rh (+)		Rh (–)	
Male	127	89.44%	15	10.56%
Female	165	77.83%	47	22.17%
P = 0.005 (*P* < 0.05)				

Distribution of blood Rh groups based on the regions (Ragdalin, Aljamail and Zaltan) is shown in table 5 indicating that the distribution percentages of blood groups in Ragdalin were (O+) was 41.3% > (A+) was 28.6% > (AB+) was 7.4% > (O –) was 6.9% > (B+) was 6.8% > (A–) was 4.3% >(AB–) was 3.2% > (B–) was 1.6%. The figure finding that the blood group (O–) was 6.9%, in Ragdalin region, which in corresponding with the findings of the study conducted by Saad (2016) in Bayda city Libya.

In Al jmile the percentages of blood groups were from highest to the lowest as the following; (A+) was 29.3% > (O+) was 27.3% > (AB+) was 16% > (B+) was 10.3% > (A–) was 7.5% >(AB–) was 4.7% > (O–) was 3.7% > B– was 0.9%. In Zaltan the percentages of blood groups were from the highest to the lowest as the following O+ was 32.3% > A+ was 27.1% > AB+ was 10.2% = A^- was 10.2% > B– was 6.8% >B^+ was 5.7% = (O–) was 5.7% > (AB–) was 3.4%. We found the most common blood group was the (O+), which was ranged between 27.3% to 41.3% followed by the blood group (A+), which was between 27.1% and 29.3% in the study regions, except of blood group (AB+) which was 16% in Al jmile region. While the other less common blood groups distributed as the blood group (O–) were between 3.7% and 6.9%, the blood group (A–) ranged from 4.3% to 10.2%, the blood group (B+) extended from 5.1% to 10.3%, the blood group (B–) extended from 0.9% to 6.8% and the blood group (AB–) extended from 3.2% to 4.7% in the study regions.

Table 5. Distribution of blood groups and their Rhesus groups of study subjects in West Coast regions (Ragdalin, Aljamail and Zaltan).

Region	ABO Blood Groups							
	O+	O-	A+	A-	B+	B -	AB+	AB-
Reqdalin	78 (41.3%)	13 (6.9%)	54 (28.6%)	8 (4.3%)	13 (6.8%)	3 (1.6%)	14 (7.4%)	6 (3.2%)
Al jmile	29 (27. 3%)	4 (3,7%)	31 (29.3%)	8 (7.5%)	11 (10.3%)	1 (0.9%)	17 (16%)	5 (4.7%)
Zaltan	19 (32.3%)	3 (5.1%)	16 (27.1%)	6 (10.2%)	3 (5.1%)	4 (6.8%)	6 (10.2%)	2 (3.4%)
P = 0.085 (*P* > 0.05)								

Table 6 shows the distribution of blood groups and their Rh groups based upon gender and their region for a population of study. In Ragdalin, we found that the most common percentage distributed of blood groups in females was the blood group (O+) followed by the blood group (A+) and also the same in the male, and while other blood groups were less common.
In Al jmile; we found that the most common percentage distributed of blood groups in females was the blood group (O+) followed by the blood group (A+) and in the male was the blood group (A+) followed by the blood group (O+), while other blood groups were less common. In Zaltan; we found that the most common percentage distributed of blood groups in females was the blood group (A+) followed by the blood group (O+) and in the male was the blood group (O+) followed by the blood group (A+), and while other blood groups were less common. It has been found that male students report more willingness to donate blood than their female counterparts (Jahanpour *et al*.,2017). Another study heighted that men are more likely to donate blood comparing to women (Bani & Giussani, 2010), these differences are likely due gender variation which affects women ability to donate (Bani *et. al.,* 2014).

Table 6. Distribution of blood groups and their Rhesus groups based upon gender for each region of study subjects in West Coast regions (*Ragdalin, *Aljamail and *Zaltan)**.**

Region	The Sex	O+	O-	A+	A-	B+	B-	AB+	AB-
*R	Male	34 (18%)	00 (00%)	24 (12.7%)	2 (1.1%)	8 (4.2%)	2 (1.1%)	2 (1.1%)	2 (1.1%)
	Female	44 (23.3%)	13 (6.9%)	30 (15.9%)	6 (3.2%)	5 (2.6%)	1 (0.5%)	12 (6.3%)	4 (2.1%)
Total study of population in Reqdalin = 189									
Region	The Sex	O+	O-	A+	A-	B+	B-	AB+	AB-
*Al	Male	12 (11.3%)	1 (0.9%)	18 (17%)	3 (2.8%)	3 (2.8%)	00 (0%)	10 (9.4%)	1 (0.9%)
	Female	17 (16%)	3 (2.8%)	13 (12.3%)	5 (4.7%)	8 (7.5%)	1 (0.9%)	7 (6.6%)	4 (3.8%)
Total study of population in Aljamail = 106									
Region	The Sex	O+	O-	A+	A-	B+	B-	AB+	AB-
*Z	Male	10 (17%)	1 (1.7%)	4 (6.8%)	3 (5.1%)	00 (0%)	00 (0%)	1 (1.7%)	1 (1.7%)
	Female	9 (15.3%)	2 (3.4%)	12 (20.3%)	3 (5.1%)	3 (5.1%)	4 (6.8%)	5 (8.5%)	1 (1.7%)
*R= Reqdalin *Al= Aljamile *Z= Zaltan Total study of population in Zaltan = 59.									

Table 7. Shows the distribution of blood groups based on Rh groups of study subjects in West Coast regions; a total of 354 participants were included in examination of blood and Rh groups in this study; found that blood groups that had positive Rh as: **O** was 126 (35. 6%), **A** was 101 (28. 5%), **B** was 27 (7.6%) and **AB** blood group was 37(10.5%); while blood groups that had negative Rh as: **O** was 20 (5. 6%), **A** was 22 (6.2%), **B** was 8 (2.3%) and **AB** blood group was 13 (3.7%); this were statistically insignificant (*P* > 0.05) (Table 7). Generally, our findings about blood type distributions are in corresponding to with global distribution of blood type as it is noticeable from the percentages that the A and O groups occur frequently, whereas the B and AB group occur less frequently. However, these

distributions may be different based on ethnic and socio-economic groups in different countries of the world (Wikipedia contributors, 2024).

Table 7. The total distribution of blood groups based on Rh groups of study subjects in West Coast regions (Ragdalin, Aljamail and Zaltan).

Rhesus	ABO Blood Groups			
	O	A	B	AB
Rh (+)	126 (35.6%)	(28.5%)101	27 (7.6%)	37 (10.5%)
Rh (-)	20 (5.6%)	22 (6.2%)	8 (2.3%)	13 (3.7%)
P = 0.204 (*P* > 0.05)				

The understanding of ABO blood and Rh system distribution is important for many aspects including blood transfusion purposes, parental testing, forensic medicine, and population genetic study. Moreover, ABO phenotype has been found to be linked with an increased risk of various diseases (Abegaz, 2021). Thus, the ABO phenotype could be a good tool for epidemiological investigations and treatment strategies for these diseases. However, further molecular studies of ABO blood groups and their association with different diseases are needed.

Conclusion

So, the prevalence of ABO groups with their Rhesus groups; in Ragdalin region; were (O+) > (A+) > (AB+) > (O –) > (B+) > (A–) > (AB–) > (B–). In Al jmile; were (A+) > (O+) > (AB+) > (B+) > (A–) > (AB–) > (O–) > (B–). In Zaltan; were (O+) > (A+) > (AB+) = (A–) > (B–) > (B+) = (O–) > (AB–). Understanding and determination of distribution of ABO blood group and Rh groups have an important impact on communities' life in residential regions and adjacent regions for the donation of blood or its derivatives. Which, import in saving of people particularly when they are exposed to accidents, surgical operations, pregnant women and other pathological states; such as thalassemia, haemophilia, leukemia and aplastic anaemia, which cannot be treated effectively without the support of a blood transfusion service.

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