



## FREQUENCY OF RED BLOOD CELLS ALLOIMMUNIZATION AMONG MULTIGRAVIDA WOMEN

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### ABSTRACT

**Background:** Alloimmunization can describe as an immune response to exposure to antigens from another individual which genetically different. Although alloimmunization is a natural event during pregnancy, frequently it is the undesirable outcome of a blood transfusion and/or transplant. Red blood cells alloantibodies can be produce after exposure to foreign RBC antigens during blood transfusion therapy or pregnancy.<sup>[1]</sup> **Methods:** This descriptive analytical prospective cross sectional study was conducted in Shendi hospital, and aimed to detect the presence of irregular antibody in multigravida women. The patient's serum was tested for the presence of clinically significant antibodies using an indirect antiglobulin method. The serum was tested against un pooled Group O cells selected to possess the relevant blood group antigens. **Results:** The results revealed that alloantibodies were detected in one multigravida women (1.7%). In this study there was no correlation between ages, number of pregnancies and alloimmunization with (P.value=0.601 and 0.818)respectively. Current study revealed that significant correlation between history of abortion and alloimmunization (P. value=0.037). **Conclusion:** The study conclude that the frequency of alloantibodies were found in 1.7% of all pregnant women participated this study, it finds that there was relationship between alloimmunization with history of abortion, also it showed that there was no association between alloimmunization and age, number of pregnancy and stage of pregnancy.

**KEYWORDS:** Red blood cells alloimmunization, Multigravida women, Sudan.

### INTRODUCTION

Maternal alloimmunization can be occurs when a mothers immune system is response to foreign erythrocyte surface antigens, to produce an immunoglobulin G (IgG) antibodies. The most common routes of maternal immune system sensitization are through blood transfusion or through the passage of fetal red blood cells accompanied with delivery, trauma, spontaneous or induced abortion, ectopic pregnancy, or invasive obstetric procedures. The alloantibodies can cross the placenta during pregnancies in alloimmunized mother and, if the fetus possesses these specific red blood cells antigens, this can resulting in fetal red blood cells haemolysis leading to anemia.<sup>[2]</sup>

Red blood cell alloantibodies also can known as unexpected immune- antibodies, found other than the naturally occurring antibodies in the body, produced in response to the entering of red blood cells possessing antigens that the subject lacks, in cases of pregnancy, blood transfusion and transplantation or injection of any immunogenic material. In pregnancy alloantibodies can be produce when fetal red blood cells possessing a paternal antigen which is a foreign to the mother, enters

the maternal circulation, this incompatibility in the blood groups between the mother and fetus can cause Haemolytic Disease of the newborn.<sup>[3]</sup>

Antibody detection is done in pregnancy to assess these pregnancies which on risk of fetal hemolytic disease resulting from presence of clinically significant maternal alloantibodies.<sup>[3]</sup>

### METHODS

This descriptive analytical prospective cross sectional study was conducted in Shendi hospital, and aimed to detect the presence of irregular antibody in multigravida women. A total of 60 venous blood samples were collected from multigravida women with age ranged between (20- 40 years) old in Shendi hospital. Ten milliliters (10 ml) of blood were withdrawn from antecubital vein of each patient after cleaning the patient skin with 70% alcohol and applying of the tourniquet above the vein a puncture site, using sterile non biogenic disposable syringe in a red tope blood container (No anticoagulant), then the serum was separated immediately by centrifugation after clot formation. The patient's serum was tested for the presence of clinically

significant antibodies using an indirect antiglobulin method. The serum was tested against un pooled Group O cells selected to possess the relevant blood group antigens.

## RESULTS

According to the table (4-1) RBCs alloantibodies was positive in (1/60) (1.7%) pregnant women, while (59/60) (98.3%) of pregnant women showed negative result.

**Table. (4.1): Antibody screening in pregnant women.**

Antibody screening	Frequencies	Percentage
Positive	1	1.7%
Negative	59	98.3%
Total	60	100%

Pregnant women that with age of (20 – 29 years) represent (46.7%), while (50%) of pregnant women with age of (30 - 39 years) and (3.3%) of pregnant women above (40 years) as demonstrated in table (4-2).

**Table. (4.2): Shows distribution of age among study group.**

Age groups	Frequencies	Percentage
20 – 29 years	28	46.7%
30 – 39 years	30	50.0%
40 – 49 years	2	3.3%
Total	60	100%

Regarding number of pregnancy, table (4-3) showed that pregnant women that have (1-3 pregnancies) was (11.7%), while (71.7%) of pregnant women have (4-6 pregnancies) and (16.7%) of them have more than (6 pregnancies).

**Table (4.6): Relationship between age and alloimmunization screening in pregnant women:**

Result of Abs screening		Age groups			Total	P. Value
		20-29	30-39	40-49		
Positive	Count	0	1	0	1	0.601
	% within Age groups	.0%	3.3%	.0%	1.7%	
Negative	Count	28	29	2	59	
	% within Age groups	100.0%	96.7%	100.0%	98.3%	
Total	Count	28	30	2	60	
	% within Age groups	100.0%	100.0%	100.0%	100.0%	

While table (4-7) showed a significant relationship between number of abortion and alloimmunization screening in pregnant women (P.value  $\leq$  0.05).

**Table (4.7): relationship between frequency of abortion and alloimmunization screening in pregnant women:**

Result of Abs screening		No of abortion			Total	P. Value
		Once	Twice	No		
Positive	Count	0	1	0	1	0.037
	% within frequency of abortion	0%	12.5%	0%	1.7%	
Negative	Count	13	7	39	59	
	% within frequency of abortion	100%	87.5%	100%	98.3%	
Total	Count	13	8	39	60	
	% within frequency of abortion	100%	100%	100%	100%	

Finally table (4 - 8) reveals no relationship between number of pregnancy and alloimmunization screening in pregnant women (P.value  $\geq$  0.05).

**Table. (4.3): Shows number of pregnancy among test group.**

No of pregnancy	Frequencies	Percentage
1 – 3	7	11.7%
4 – 6	43	71.7%
6 >	10	16.7%
Total	60	100%

Also according to table (4 - 4), (21.7%) multigravida women with once time history of abortion, and (13.3%) twice time of abortion.

**Table. (4.4): Shows number of abortion among study group.**

No of abortion	Frequencies	Percentage
Once	13	21.7%
Twice	8	13.3%
No	39	65.0%
Total	60	100%

About (1.7%) of pregnant women was in first trimester, while (40%) was in second trimester, and (58.3%) of them was in third trimester as noted in table (4 - 5).

**Table. (4.5): Show distribution of study group according to stage of pregnancy.**

Age groups	Frequencies	Percentage
First trimester	1	1.7%
Second trimester	24	40.0%
Third trimester	35	58.3%
Total	60	100%

Table (4 - 6) reveals no relationship between age and alloimmunization screening in pregnant women (P.value  $\geq$  0.05).

**Table (4.8): relationship between number of pregnancy and alloimmunization screening in test group:**

Result of Abs screening		No of pregnancy			Total	P value
		1-3	4-6	More than 6		
Positive	Count	0	1	0	1	0.818
	% within No of pregnancy	.0%	2.3%	.0%	1.7%	
Negative	Count	7	42	10	59	
	% within No of pregnancy	100.0%	97.7%	100.0%	98.3%	
Total	Count	7	43	10	60	
	% within No of pregnancy	100.0%	100.0%	100.0%	100.0%	

## DISCUSSION

The objective of the current was to detect of RBCs alloimmunization and frequencies in pregnant women which is an important issue to minimize the complications of alloimmunization in pregnancy. It will also aid the development of screening and preventive management programs based on the calculated prevalence. Alloimmunization has been a focus of concern for obstetricians and hematologists for centuries in their quest to try and eliminate HDFN as a common obstetric problem; in this study the focus was screen the presence of unexpected alloantibodies in pregnant women.

This study observed that the frequency of alloantibodies in the study population (1.7%), this finding was similar to the result of study which done in India by Sangeeta Pahuja and his colleagues (1.25%).<sup>[4]</sup> it is also considerably higher than the prevalence reported in a Swedish study, with (0.48%) prevalence, and in a Canadian study, with (0.36%)(22) prevalence. This difference in immunization frequency between these studies was not surprising, because antibody prevalence rates were known to vary between countries, probably due to variations in transfusion practices, testing techniques, and gene frequencies. Furthermore, lower immunization rates were reported with protocols that include antenatal RhIg dosing.<sup>[5]</sup>

There was no significant relationship between number of pregnancy and alloimmunization, with P.value (0.818), this result was agree with previous study conducted in Khartoum by Abdiwahab I with P.value (0.137).<sup>[6]</sup>

An insignificant relationship observed between alloimmunization and number of pregnancy with P.value of (0.818). This disagrees with previous study conducted in Khartoum by Afra H and Mohammed<sup>[7]</sup> with P.value of (0.002).

Regarding relationship between abortion and alloimmunization, the result of this study reveals that there was significant association with P.value of (0.037) this result agree with that of study done by Afra H and Mohammed.<sup>[7]</sup>

## CONCLUSION

By the end of this study we conclude that the frequency of alloantibodies was found in 1.7% of all pregnant women. The present study found that there was a

relationship between alloimmunization with history of abortion, and no association between alloimmunization and age, number of pregnancy and stage of pregnancy.

## REFERENCE

1. Samuel L. Aitken and Eric M. Tichy. RhOD immune globulin products for prevention of alloimmunization during pregnancy. American Journal of Health-System Pharmacy. 2015; 72(4): 267-276.
2. Al-Dughaishi T, Al-Rubkhi IS, Al-Duhli M, Al-Harrasi Y, Gowri V. Alloimmunization due to red cell antibodies in Rhesus positive Omani Pregnant Women: Maternal and Perinatal outcome. Asian J Transfus Sci., 2015; 9(2): 150-54.
3. Bricca P1, Guinchar E, Guitton Bliem C. Management of fetomaternal red cell alloimmunizations. Transfus Clin Biol., 2011; 18(2): 269-76.
4. Sangeeta Pahuja, et al. Blood Transfus, 2011; 9: 388-93.
5. Gunnar B. Hulda H. et.al. Red blood cell alloimmunization in pregnancy during the years 1996-2015 in Iceland: A nation-wide population study.
6. Abdiwahab I. Prevalence of Rhesus Allo - Immunization in Pregnant Women, University of Medical Science and Technology, 2018.
7. Mohammad, Afra Hammad. Frequency of Red Blood Cells Allo-Antibodies Among Sudanese Multi- Parous Women in Khartoum State, SUST Repository, 2012; 82.