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To study the frequency of weak D u positivity among the donor coming to referral tertiary care teaching center –sir T hospital Bhavnagar

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Abstract **Original Research Article**

Background: D antigen is highly immunogenic even weak D is also potent enough to cause hemolytic transfusion reaction so it is necessary to detect the weak D, and should consider as Du positive as donor and Du negative as recipient for safe clinical transfusion practice. ***Method:*** Rh- typing has done by antisera IgM anti-D monoclonal antisera D1, blend of IgM and IgG monoclonal antisera D2…. (Tulip diagnostic) by slide and immediate spin tube method and Gel card with AHG antisera. ***Result:*** total 17717 donor blood sample were tested and it is observed that Prevalence of Rh-negative donor is 1091(6.15%) and prevalence of weak Du positive among total donor is 0.01% while it is 0.18% among Rh negative donor. ***Conclusion:*** The prevalence of weak D u is very low and comparison with other author is difficult due lack of standard set of technique and reagent. Even though red cell with weak Du are less immunogenic than Rh negative all donor must tested for Du testing should implement in routine blood bank practice for safe transfusion practice.

Keywords: Du test, weak D u, agglutination, antisera.

INTRODUCTION

The red cell membranes have number of blood group antigen out of which ABO and Rh are clinically significant. The ABO blood group system was the first human blood group system to be discovered by Austrian scientist Karl Landsteiner in 1900, Followed by discovery of Rh antigen by Landsteiner and Wiener in 1940 by immunizing rabbits and guinea pig with red cells of rhesus monkey [1,2,3]. Has brought largest breakthrough in transfusion practice Because of conflicting results in Rh grouping, a weakly reacting antigen was described by Stratton in 1946 [4].

In Rhesus (D) system, blood groups are Rh-positive or Rh-negative on the basis of presence or absence of Rhesus D antigens on red cell surface. The Rhesus antigens are determined by three pairs of closely linked allelic genes located on chromosome one [5] the D antigen among the Rhesus positive individual present variable in strength of immunogenicity. So Du Red cell have lesser number of D antigen per cell than normal Rh-positive so they present as weaker than expected D antigen and can be mistype as Rh-negative .such red cell make allo anti- D antibody against the missing D mosaic [6]. The weak D phenotype, formerly known as Du is a quantitatively weakened form of the normal D antigen. The most important risk with this phenotype is alloimmunization among the recipients.

As D antigen is highly immunogenic, individuals with weak D phenotype are typed depending upon whether the person is donor or the recipient; the recipients with weak D are considered D negative and must be transfused with D negative blood and the donors are considered as D positive. Mothers with weak D fetus must receive Rh immunoprophylaxis as passage of weak D red cells from fetus to mother may result in sensitization [7, 8]. First blood grouping of donor done by forward method by using antisera A, B, and D of (tulip diagnostic) for forward

MATERIAL AND METHOD

This study was undertaken with aim of evolution of frequency of weak Du among blood donor coming to sir T. Hospital in period of January 2018 to June 2019 , Government medical college ,a tertiary care teaching institute and dectcing it's clinical importance in our transfusion practice.

All the sample were tested for ABO blood grouping by forward and reverse method by using antisera Anti-A, an Anti-B of (tulip diagnostic) Rh-typing done by Antisera IgM anti-D monoclonal antisera D1, blend of IgM and IgG monoclonal antisera D2…. (Tulip diagnostic) by slide and immediate spin tube method and Gel card with AHG antisera Sample show agglutination in immediate spin tube method with anti –D Antisera, are labeled as Rh –positive and those sample does not show agglutinin were further tested for Du test. As per policy of our blood bank all Rh-D negative tests on blood donor, Du test recommended

Method for Rh -typing

Prepare 5% washed red cell suspension of test sample and take three test tube label 1,2, And 3 –as control. put a drop of anti –D(D1) in test tube 1, a drop of anti –D(D2) in test tube 2,and a drop of 22% Bovine albumin in test tube 3.to this add 5% test cell suspension to each tube. Mix well, centrifuge at 1000 rpm for 1 min.Resuspend cell button & look for agglutination Control tube should show no agglutination Sample show agglutination in immediate spin tube method with anti –D Antisera, are labeled as Rh –positive and those sample does not show agglutinin were further tested for Du test. By tube method and matrix Gel card incorporate with AHG (coomb's sera).

For tube method take 1 drop of 10% suspension of D negative red cells to a test tube and add 2 drops of Anti D (D2)(blend of IgG + IgM) Incubate at 37° C for 30 minutes. After incubation give three cells wash with normal saline. Make dry red cell button and add polyspecific AHG reagent. Look for agglutination. If there is agglutination Du Positive. If there is no agglutination Du Negative, result are microscopically confirmed.

While for matrix gel card method remove aluminium foil gently, label it with donor BBR number add 50 ul of 1% suspension of donors' red cells [1000ul of Diluent -2 +10 ul of Test Packed Red Cells] to microtube of Matrix gel card then add 50 ul of anti –D (D2) antisera afterward incubator at 37^0C for 15 minutes and centrifuge for 10 minutes in ID centrifuge, if red cells settle to the bottom of microtube then it is weak D negative. And if red cell agglutinates are trapped in gel matrix then it is weak D positive sample

OBSERVATION AND RESULT

Table -1

Blood group	Rh - positive		Rh negative		Weak Du positive	total
	Male	female	male	female	male	
A	3873	170	243	11		4297
B	5479	272	358	13	01	6123
O	4939	282	331	23	01	5576
AB	1530	79	104	08		1721
Total	15821	803	1036	55	02	17,717

DISSCUSION

It has been observe from our result of study which are tabulated in above table that male donor are more than female donor that is 16857(95.14%)and 858(4.84%) respectively, similar result are observe elsewhere in India [12,13]. Women lose blood every month in menstruation and nutritional factor so are anemic and they exclude in pre –donation screening more ever obstetrical factor like pregnancy, lactation, social taboo, lack of motivation and fear of blood donation are reason why female donor are very less compare to male donor [14]. Second thing prevalence of Rh –positive donor is more ,that is 16624(93.83%) while prevalence of Rh-negative donor is 1091(6.15%) and prevalence of weak Du positive among total donor is 0.01% while it is 0.18% among Rh negative donor Which is comparable to Agarwal N et al, observed a lower prevalence of weak D in their study (0.005 % of total donors and 0.09 % of Rh negative donors) [10]

The incidence of Rh negativity among the people varies worldwide between 3%-25% and that of weak D antigen ranges from 0.2%- 1% [9]. Low prevalence of Rh negative donor is due to high RHD gene prevalence among Indian population. weak Du due to single point mutation in RHD gene lead to change amino acid intracellular or trans cellular lead lesser number of D antigen [11].

Although different author had studied the prevalence of weak Du among different population, comparison is difficult due to lack of set of standard technique and reagent, but we can conclude from our study that even though the prevalence rate of Rh negative donor is low and weak D u positivity is least and red cell of weak Du are less antigenic than Rh negative but can cause immunological reaction and clinically significant. So all donors with weak D u should label as Rh positive and Du testing should be in transfusion practices.

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