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RESEARCH ARTICLE

A STUDY ON THE PREVALENCE OF RHESUS FACTOR AMONG PREGNANT WOMEN VISITING AT TERTIARY CARE CENTER IN NORTH KARNATAKA

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ABSTRACT

Background: Hemolytic disease of the newborn, secondary to Rhesus D (Rh D) iso-immunization, contributes significantly to perinatal morbidity and mortality.
Objective: The objective of the study was to determine the frequency of different blood groups in the region with special reference to Rh factor which would not only help in blood transfusion services but also eliminate the risk of erythroblastosis fetalis in the neonates
Materials and Methods: A 0ne and half year retrospective study of rhesus negative women was carried out at civil hospital, Belagavi between March2013 to September2014.
Result: The prevalence rate of Rh D negative women in North Karnataka for antenatal care, 205 (4.58%) were Rh D negative women. Out of that 68 (33.17%) of the Rh D negative women were of blood group A followed by blood group B 67 (32.69%), blood group O 47(22.93%), and blood group AB 23 (11.21%), respectively.
Conclusion: There is a need for adequate counseling of pregnant women on the importance of Rh D negative factor during the antenatal period in order to prevent hemolytic disease of the newborn.

INTRODUCTION

The AB and Rhesus factor (Rh D antigen) are recognized as the major blood group antigens present in the red blood cells. In 1900, the A, B and O types were determined by Karl Landsteiner. Rhesus blood group system was the fourth system to be discovered by Landsteiner and Alexander S. Wiener in 1937 (Landsteiner and Weiner, 1940). The Rhesus system is named after Rhesus monkeys which were used in the experiments that led to the discovery of the system. The presence of the Rh factor, a protein on the red cell surface, constitutes Rh +positive (Rh) person, whereas the absence of Rh factor indicates a -negative (Rh) person. Dr. Philip Levine made a connection between the Rh factor and the incidence of erythroblastosis fetalis resulting from the Rh factor. Wiener realized adverse reactions from transfusions were also resulting from the Rh factor. (Jayakkodi Gauthaman and Kalaiselvi, 2013) The objective of the study was to determine the frequency of different blood groups in the region with special reference to Rh factor which would not only help in blood transfusion services but also eliminate the risk of erythroblastosis fetalis in the neonates. The rhesus (Rh D) group system is important in blood transfusion because the Rh D immune response in Rh D negative women is the primary etiology for hemolytic disease of the newborn (Levin *et al.,* 1941). The identification of the Rh D antigen and its description is a cornerstone of modern immunehematology (Ajayi, 2006). Rh D iso-immunization, a disease of genetic predisposition, has been a focus of concern for obstetricians and hematologists for centuries. The frequency of Rh D iso-immunization in the general population continues to be a point of significance for the clinician, (Shaughnessy and Kennedy, 2001) as this significantly contributes to morbidity and mortality in obstetric practice. Allo-immunization to Rh D is a major factor in perinatal mortality and morbidity, and results in the compromise of the affected women's obstetric career. (Ajayi, 2006; Shaughnessy and Kennedy, 2001; Kotila *et al.,* 2005) There is a need for further studies in Rh D (Rh D) negative pregnant women because several factors affect the development of allo-immunization and its prognosis (Kotila *et al.,* 2005).

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MATERIALS AND METHODS

Data regarding the blood group details of women visiting for antenatal care at civil hospital, Belagavi from March 2013 to September 2014 for delivery were collected from the hospital records. Blood group details of the patients visited for antenatal care during each month of the year were noted down. Number of candidates belonging to A, B, AB and O groups were consolidated. Rh factor details of the patients were also noted and consolidated.

A total number of 4473 subjects were found during the study period. They belonged to both rural and urban areas, mostly lower middle class. Their age group ranged from 18 to 40 years.

The ABO and Rh D factors are part of the routine investigations during the antenatal booking of women attending the antenatal clinics at the maternity complex of the Hospital. Antibody screenings are routinely performed at booking on Rh D negative women. Serial antibody titer levels are also performed at subsequent visits for those who are Rh D negative. The previous obstetric history, transfusion history, and obstetric findings were noted. Other information including age, religion, tribe, occupation, and social and family history on the booked Rh D negative pregnant women were obtained from their case files. The Rh D blood group systems of the husbands of women booked for antenatal care is not routinely carried out in this hospital unless this is specifically requested by the managing clinicians. Ethical review and clearance was obtained from the civil Hospital and Ethics Committee. Department protocol was via informed written consent prior to data collection.

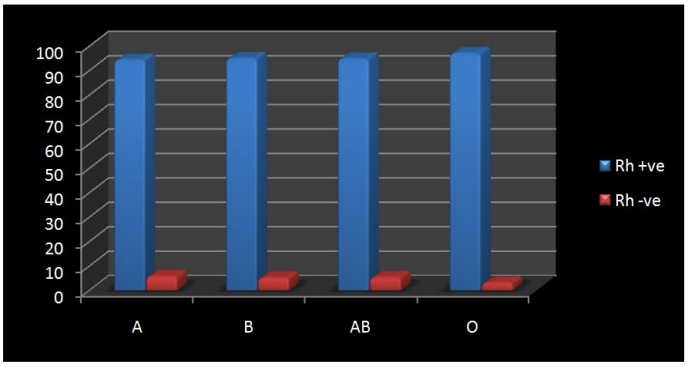

Fig. 1. Percentage of various blood groups (ABO and Rh)

RESULTS

Four-thousand Four-hundred and Seventy three (4473) women who were visiting for antenatal care at civil hospital, Belagavi included in this study for the period of one and half year. ABO and Rh D blood groups determined as part of their routine investigations at booking. Blood group O 1536 (34.33%) was the commonest blood group, followed by blood groups B(29.18%), A(26.18)%, and AB(09.79 %), respectively. (Table 1) The relative percentage of Rh D blood groups in (Table 2) shows that 4268 (95.42%) women were Rh D positive while 205(4.58%) women were Rh D negative. During the period under study, 205 Rh D negative pregnant women were seen. Sixty eight of the Rh D negative women (33.17%) were of blood group A followed by blood group B: 67 (32.69%), blood group O: 47 (22.93%), and blood group AB: 23 (11.21%), respectively (Table 1).

At the Civil hospital, Belagavi, routine prophylaxis for Rh D negative pregnant women using Rhogam (Anti D) 500 IU is carried out within 72 h of delivery. Two-hundred and three (99.3%) Rh D negative women received Rhogam postpartum while 2 (0.7%) did not receive Rhogam because sensitization had already occurred.

Table 1. Prevalence of various blood groups in the studied Subjects

	Blood Group	Total N= 4473 (%)	Total Rh+ve N= 4268 (%)	Total Rh-ve N=205 (%)
1	A	1194 (26.69%)	1126 (26.38%)	68 (33.17%)
2	B	1305 (29.18%)	1238 (29.00%)	67 (32.69%)
3	AB	438 (09.79%)	415 (09.73%)	23 (11.21%)
4	O	1536 (34.33%)	1489 (34.89%)	47 (22.93%)

Table 2. Distribution of Rhesus Blood Group

Rhesus blood Group	Frequency	Percentage
Rh D Positive	4268	95.42
Rh D Negative	205	4.58
Total	4473	100

DISCUSSION

The prevalence of Rh D negative women in Belagavi district in this study is 4.58%. This is similar to previous studies done at Ibadan and Abraka in Nigeria (Kotila *et al.,* 2005; Onwukeme, 1990). This rate shows a low frequency of Rh D negative Rh D blood group system in this environment. This finding is similar to that previously reported amongst African subjects, West Indians, and blacks in Great Britain (Ezeilo, 1970; Odokuma *et al.,* 2007). The results are, however, different from those reported from the Eastern highlands of Papua Guinea where the entire population was reported to be 100% Rh D positive (Salmon *et al.,* 1988). The Rh D negative blood system is of great clinical significance, especially in medical emergencies where appropriate group compatible blood may not be available. In pregnancy, Rh D negative women whose husbands are Rh D positive need adequate counseling on the etiology of Rh D iso-immunization during the antenatal period to prevent hemolytic disease of the newborn (Kotila *et al.,* 2005; Ezeilo, 1970; Sembulingam. 2006). Rh D positive women were more commonly seen than Rh D negative women. No correlation was observed between ABO and Rh D blood groups.

Rhogam is given only as a prophylaxis and is useless once sensitization has occurred. One of the problems militating against effective prophylactic programs against Rh D iso-immunization is that it is very expensive and many women cannot afford to buy it. There is need for proper public education about this preventable disease. Obstetricians, Hematologists, and Neonatologists also need to put in place a proper protocol for the management of Rh D negative pregnant women to prevent Rh D iso-immunization and to properly care for affected children.

Conclusion

The need for blood group prevalence studies is multipurpose. Generation of simple database of blood groups provides data about the availability of human blood in case of regional calamities but also serves as a forewarner of future burden of disease like erythroblastosis fetalis. An association of complications like erythroblastosis fetalis with Rh blood group would make the data generated by the study, to be useful for health planners, while making efforts to face the future health

challenges in the region. Such studies need to be carried out at regional levels.

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