

PREVALENCE OF Rh AND ABO BLOOD GROUPS IN HIV SEROPOSITIVE PREGNANT WOMEN IN ENUGU, NIGERIA

*⁺ R.O. NNELI; *B.O. EKPO; *O.C. OHAERI and **J. EGENE

**Department of Physiology, College of Medicine & Health Sciences, Abia State University, P.M.B. 2000, Uturu-Nigeria; and ** Department of Medical Laboratory Services, Mother of Christ Specialist Hospital and Maternity, Ogui, Enugu.*

Summary: HIV status and blood groups determination (Rhesus and ABO groups) in 3691 pregnant women attending antenatal clinic at a Mission Hospital and Maternity and 1199 non-pregnant women visiting the same institution for marriage-related matters, or blood donation, or out-patient department between 1999 – 2002 were studied. Blood sample from each subject was screened for HIV using the quick test kits and tested for blood group types with anti-sera A,B,AB, and D. Overall, the prevalence of blood group O+ was higher than in the general population with highest rate of 62.9% in HIV+ pregnant women followed by 58.4% in HIV- pregnant women and 58.0% in non-pregnant women. No difference was observed in groups A+, B+, AB+, O- for the three categories of subjects studied. Blood groups B-, AB- were conspicuously absent in HIV+ pregnant women but non-significant in HIV- pregnant women and the control. A- was very few in all the categories. Rh -ve accounted for 3.16% (HIV+), 3.46% (HIV-) and 2.67% (Control) while Rh +ve were 96.84% (HIV+), 96.06% (HIV-) and 97.33% (Control). Thus, the higher than normal prevalence of group O+ in HIV+ pregnant women is indicative of the population size for this group. The very low prevalence of Rh -ve in type A- suggests that incompatibility could be higher than in this population and protective in HIV infection contrary to the previous report in apparently healthy population. The obvious absence of Rh- in AB group suggests that AB may have a higher percentage of protection against immunization. Hence in group B, less incidence of Rh incompatibility and haemolytic disease of the young in the mothers in blood group AB will occur.

Key Words: Rhesus genes, ABO blood groups, prevalence, Pregnant women, HIV seropositive.

Introduction

Previous studies reported on the distribution of Rhesus inheritance in the general population (Iyawe *et al*, 1999) and in the apparently healthy pregnant women attending antenatal clinic (Igbigbi *et al*, 1992; Feyi-Waboso and Amadi, 2001). The empirical association of a few diseases with certain blood groups have been demonstrated (Ajiwe *et al*, 1997). Mandatory HIV screening had been introduced in this Hospital and Maternity - Mother of Christ Specialist Hospital and Maternity, Ogui – Enugu since 1999 in line with the standards proposed by Boyo (1990) and United States Department of Health (1994). No report on the prevalence of Rh and ABO blood groups of HIV infected pregnant women had been cited in the literature. Also, the possible association of a particular blood group to the incidence of HIV infection and the implication of Rh- in HIV+ pregnant women were the objectives of this study.

Methods

Subjects

A total of 3691 pregnant women aged 16 – 46 years attending antenatal clinic at the Mother of Christ Specialist Hospital and Maternity, Ogui – Enugu during first booking, and 1199 randomly selected apparently healthy non –pregnant women aged 16 – 55 years who visited this site for marriage – related matters, or blood donation, or attending the Out- patient department were enrolled for this survey. Informed consent of the subjects were obtained after proper explanation of the procedures as well as approval from the Ethical Committee of this institution was obtained.

Procedures

The pregnant and non- pregnant women were screened for HIV using the quick test kits – Uni Gold (Trinity Biotech Plc. Wicklow, Ireland) and ACON (ACON laboratory, Sandiego, California, USA) using blood samples collected from the veins of selected pregnant and non-pregnant women. Blood

sample of each subject collected into EDTA tubes were used for the determination of ABO and Rh antigenicity using anti-sera A, B, AB, and D (manufactured by Laboratory Diagnostic Products Ltd). A drop of each anti-A, anti-B, anti- AB and anti- D were placed with the help of a pipette on each column of tiles with two rows of four columns and each marked A, B, AB and D respectively. A drop of the subject's blood was placed on the anti-sera on each column. The cells and serum in each circle were then mixed with a wooden swabstick, breaking off the used portion after each mixing, and the result read, based on the presence or absence of agglutination. This procedure was repeated for all the subjects. The results were analysed by using the GraphPad software to compare the means. P values of less than 0.05 was considered significant.

Results

Table 1 shows the percentage prevalence of Rh within the ABO Groups in non-pregnant women (Control) while Table 2 shows the prevalence among HIV+ and HIV- pregnant women. Overall Rh +ve for HIV+ pregnant women was 96.84%; for HIV- pregnant Women, it was 96.06% and for non-pregnant women-97.33% while Rh -ve for HIV+ pregnant women was 3.16%; HIV- group - 3.46% and non-pregnant - 2.67%. In the combined test, blood group O+ was the most numerous (62.9% for HIV+; 58.4% for HIV-; 58.0% for non-pregnant), followed by A+ (19.4% for HIV+; 22.5% for HIV-; 22.3% for non-pregnant women), and B+ (13.4% for HIV+; 14.0% for HIV-; 16.0% for non-pregnant) while O-, AB+ B-, A- were few for HIV- and AB- and B- were not found among HIV+ pregnant women.

Table 1: Percentage Prevalence of Rh and ABO blood groups of non- pregnant women in Enugu, Nigeria (Control).

Groups	1999	2000	2001	2002	Total	% Prevalence	Approximation
A+	22.0	20.6	22.0	23.3	267	22.26	22.3
A-	-	-	0.35	0.71	5	0.42	0.40
B+	20	13.95	18.90	14.82	189	15.76	16.0
B-	-	-	0.70	0.36	4	0.33	0.30
AB+	4	1.66	1.75	2.49	26	2.17	2.0
AB-	-	-	-	0.36	2	0.17	0.2
O+	54.0	63.8	54.2	56.23	690	57.55	58.0
O-	-	1.66	2.10	1.78	21	1.75	2.0
Total	50	301	286	562	1199	100%	100%

Overall Rh+ve = 97.33%; For Rh-ve = 2.67%

Table 2 : Prevalence of Rh and ABO blood groups in HIV+ and HIV- pregnant women in Enugu, Nigeria

Groups	1999		2000		2001		2002		Total		Percent Prevalence	
	HIV+	HIV-	HIV+	HIV-	HIV+	HIV-	HIV+	HIV-	HIV+	HIV-	HIV+	HIV-
A+	16.67	23.64	15.0	21.95	22.95	18.48	21.62	24.43	36	789	19.35	22.5
A-	-	0.78	-	0.85	3.28	0.77	-	0.89	2	29	0.10	0.63
B+	18.75	0.89	10.0	11.59	13.11	20.03	10.81	15.29	25	491	13.4	14.01
B-	-	0.10	-	0.24	-	0.5	-	0.40	-	8	-	0.23
AB+	-	0.88	-	2.32	3.28	3.08	-	0.89	2	57	1.08	1.63
AB-	-	-	-	0.24	-	-	-	0.20	-	4	-	0.11
O+	60.42	60.99	72.50	61.10	57.38	54.85	64.87	55.81	117	2046	62.9	58.4
O-	4.17	2.82	2.50	1.71	-	2.62	2.70	2.09	4	81	2.15	2.31
Total	48	1028	40	820	61	649	37	1007	186	3505	100	100

Overall Rh+ve for HIV+ = 96.84%; for HIV- = 96.06% : Rh-ve for HIV+ = 3.16%; for HIV- = 3.46%.

Discussion

The distribution of Rh antigens within the ABO blood group system Obtained in this study agreed with the pattern reported by

Igbigbi *et al* (1992) in the apparently healthy pregnant women except for AB group that had a lower prevalence. It also supported the findings of Ukaejiofor *et al* (1995), however,

this present report did not investigate on the sub-antigenic status as was done by these workers. The prevalence pattern for HIV- and non-pregnant women corroborated the observation of Iyawe *et al* (1999) in apparently healthy subjects in Lagos and Benin City with types A- and AB- conspicuously absent as compared to our observed absence of B- and AB-. This is indication of higher percentage of protection Against Rh alloimmunization problem and low incidence of incompatibility and haemolytic disease of the new born in the offsprings of mothers in blood group AB, just as A incompatibility forms 90% protection and B (53%) against Rh -ve immunization (Murray *et al*, 1965). The rate of group O+ among HIV+ pregnant women though higher than earlier reports but it was not significant, hence suggests no empirical association with HIV/AIDS in pregnant women as certain other groups have been demonstrated that is, blood group O persons linked with increased incidence of peptic ulcer disease and group A with cancers of the stomach, small pox and pernicious anaemia relative to groups O and B (Bove, 1977). There may be no link between the possession of O+ and the incidence of HIV infection as hypothesized by Athreya and Coriell (1967). The lower prevalence of Rh - (< 3.5 %) in the HIV+ pregnant women is contrary to the reported values in the literature indicating increased awareness of Rh incompatibility (Feyi-Waboso and Amadi, 2001). This study therefore establishes a pattern of Rh and ABO blood groups of HIV infected pregnant and non- pregnant women. It also shows that no particular blood group type could be linked to the occurrence of HIV infection. HIV is contracted during child bearing age in females (Anteyi *et al*, 1994) and contraction at this age group range of certain diseases but not later in life has been reported to have a link with some blood groups to disease being acquired via natural selection (Boorman *et al*, 1977).

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References

- Ajiwe, V. I. E., Anyamene, C. O., Umerie, S. C., Okeke, C. A., Njoku, O. O. (1997). Relationship between blood genotypes and blood groups of a Nigerian population. *Medicare J*, 6(5): 20 – 24.
- Anteyi, E. A., Agbaji, O. O., Idoko, J. A., Ukoli., C. O., Zoaka, A. Y., Idoko, I. O. (1994). AIDS in Adults in Jos, Nigeria. *Nig. Med. J*, 22(1):13 – 15.
- Athreya BH, Coriell LL. (1967). Relation of blood groups to Infection. *Amer. J. Epidemiol.*, 86(2): 292 – 303.
- Boorman KE, Dodd BE, Lincoln PJ. (1977). *Other Diseases Associations and Chimeras in Blood Group Serology: Theory, Techniques, Practical Applications*. 5th Edition, Longman Group Ltd, London, New York.
- Bove, J. R. (1977). Blood Groups. In: *Mc Graw Hill Encyclopaedia of Science and Technology*, Mc Graw Hill Inc. New York 2: pp 295 – 297.
- Boyo, K. M. (1990). HIV infection: the ethics of anonymised testing and testing of pregnant women. *J. of Medical Ethics* 16: 173 –178.
- Feyi-Waboso, P. A., Amadi, A. N. (2001). Prevalence of the Rhesus negative gene and Awareness of its implications. *J. of Med. Invest. and Pract*, 2: 11 –13.
- Igbigbi, P.S., Korubo-Owiye, T., Didia, B. C. (1992). ABO and Rhesus genes are homogenously distributed in Socio-Economic classes in Port Harcourt, Nigeria. Abstract Proceedings of the 14th Physiological Society of Nigeria Conference at Ogun State University, Ago-Iwoye, Nigeria. p.2.
- Iyawe, V. I., Ighoroje, A. D. A., Akinlabi, G. A. (1999). Preliminary survey of Rhesus inheritance in ABO blood groups in Nigeria. *Nig. J. Physiol. Sci.* 15(1-2): 18 – 19.
- Murray, S., Knox, G., Walker, W. (1965). Haemolytic disease and Rhesus genotypes. *Vox Sang.*(Basel), 10: 257.
- Ukajeiofor, E. O., Okonkwo, W. C., Tagbo, R. N., Emeribe, A. O. (1995). ABO and Rhesus blood groups in a Nigerian Population. *Orient of Med.* 7 (3 –4): 54 – 57.
- United States Department of Health (1994) HIV testing in Antenatal period.

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