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Packed Cell Volume of HIV Positive Pregnant Women in Enugu, Nigeria

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Abstract: Previous studies in Nigeria were on the seroprevalence of HIV infection but none of these studies reported on its effects on the haematological parameters or on these indices in pregnancy. This 4 year study determined the packed cell volume of HIV infected pregnant women in a Misson Specialist Hospital and Maternity in Enugu, Nigeria. Three milliliters of blood were collected intravenously from the subjects into EDTA tubes. These were centrifuged and the serum was screened for HIV with the quick test kit for HIV-1/HIV-2. Packed Cell Volume (PCV) was estimated by the microhaematocrit centrifuge and the result read on the Reader. The mean PCV of the HIV infected pregnant women was 32.83±0.14% (SEM) while it was 37.13±1.41% (SEM) for HIV-pregnant women and 36.65±1.37% (SEM) for non-pregnant women. Thus, HIV infection reduced the PCV in pregnancy and to a level suggestive of anaemia.

Key words: Haematocrit, haematological indices, HIV screening, pregnancy, seroprevalence

INTRODUCTION

In Nigeria, previous studies on HIV/AIDS have reported on the seroprevalence in pregnant women at Teaching and Government hospitals (Harry *et al*., 1994; Okwori and Bello, 1999). In other countries of Sub-Saharan Africa, higher seroprevalence have been reported with most of the studies conducted in Missions hospitals and maternities (Salmon and Murray, 2001). HIV infection perturbs all cells, tissues, organs and systems of the human body (Peters and Richards, 1990) as well as haematological cells and systems (Pantaleo *et al*., 1993). Anaemia is the commonest haematological feature encountered in HIV infection and 90% of AIDS cases have anaemia of some degree (Barry *et al*., 1994). Also, anaemia is a major problem common in pregnancy and children (De Maeyer and Adiels, 1985). This 4 year study determined the Packed Cell Volume (PCV) of HIV infected pregnant women in a Mission's health institution-Mother of Christ Specialist Hospital and Maternity, Ogui-Enugu, Nigeria.

MATERIALS AND METHODS

Subjects: A total of 4452 apparently healthy non-pregnant women (normal control) aged 16-55 years and 4850 pregnant women aged 16-45 years constituted the study population. The study was carried out over a 4 year period (1999-2002). The pregnant women were selected at first booking for antenatal care clinic at the Mother of Christ Specialist Hospital and Maternity, Ogui-Enugu, Nigeria. Apparently healthy non-pregnant women who visited this center for compulsory pre-nuptial HIV screening tests, from outpatient department and blood donation served as the normal control.

Consent and Ethical clearance: Informed consent was sought and Obtained from the subjects as well as approval from the Ethical Committee obtained prior to the commencement of this survey.

HIV Screening and PCV determination: Five milliliters of blood were collected intravenously from the subjects at mid-morning into EDTA tubes for the various tests. Three milliliters of the blood samples were centrifuged at 1600 rpm to obtain the serum for the HIV screening. The quick test kit for HIV-1/HIV-2 UniGold (Trinity Biothech Plc, Wicklow, Ireland) and ACON kit (ACON Laboratory, Sandiego, CA, USA) were used for the HIV screening. Packed Cell Volume (PCV) (haematocrit) was determined with the remainig blood sample using the Hawskley microhaematocrit centrfuge method. The capillary tube was filled blood via capillary action and thereafter, one end was sealed with plasticine, then was spined at 1500 rpm for 5 min and the packed cell level read off the haematocrit reader. The mean values were statistically analysed using the Student-t-test on the GRAPH PAD software and a p value of less than 0.05 were considered significant. The results are in represented as mean±SEM%.

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Table 1: Packed Cell Volume (PCV) of HIV seropositive, seronegative pregnant and non-pregnant women in Enugu-Nigeria (1999-2002)

Years	PCV Non-pregnant women	PCV HIV-pregnant women	PCV HIV+pregnant women	Range p<0.05
1999				
PCV% (SEM)	35.7 (1.13)	36.3 (0.01)	32.5 (0.28)	Yes
Age Range	(16-40)	(16-45)	(16-40)	
(years)	(1012)	(1020)	(43)	
Number				
2000				
PCV% (SEM)	34.3 (0.60)	34.7 (0.04)	33.2 (0.01)	ns
Age Range	(16-50)	(16-45)	(16-40)	
(years)	(1350)	(1036)	(31)	
Number				
2001				
PCV% (SEM)	36.0 (0.72)	36.3 (0.38)	32.8 (0.12)	Yes
Age Range	(16-40)	(16-45)	(16-40)	
(years)	(1014)	(1378)	(61)	
Number				
2002				
PCV% (SEM)	40.6 (0.60)	41.2 (0.02)	32.8 (0.08)	Yes
Age Range	(16-55)	(16-45)	(16-40)	
(years)	(1070)	(1222)	(37)	
Number				
Mean (SEM)	36.65 (1.37)	37.13 (1.41)	32.83 (0.14)	Yes

ns: Not significant

RESULTS

The result showed that the PCV for the HIV infected (HIV+ve) pregnant women was 32.83±0.14% (SEM); for HIV-ve pregnant women, it was 37.13±1.41% (SEM) and for apparently healthy non-pregnant women, it was 36.65±1.37% (SEM) (Table 1).

DISCUSSION

From this study, it was observed that the packed cell volume of the HIV infected pregnant women was lower than those of the HIV-ve pregnant women and the apparently healthy non-pregnant women. This confirmed the earlier report that HIV caused reduction in erythrocyte levels and hence predisposes them to anaemia (Davis and Zauli, 1995). It corroborates the observation that there are factors, viral, host and their interaction that determine the time, onset, the severity and type of haematological defect manifested (Gallo, 1990). The mean PCV of the HIV infected pregnant women fell within the WHO cut off point defining anaemia for pregnant women, ≤11 g dL^{-1} or PCV ≤33% (Hereberg, 1991) and Hb level of 10g% or less, PCV of 30% or less used by Ogunbode (1984) in Nigeria. Present result was consistent with the 30±8.23% (SEM) reported among Tuberculosis (TB) patients in Jos, Nigeria (Anteyi *et al*., 1996); 34±2.30% in asymtptomatic patients and 20.0±1.26 in HIV/AIDS patients at Kano, Nigeria (Emokpae *et al*., 1999); 25.7±9.4% in children with HIV in Jos, Nigeria (Angyo *et al*., 2000).

CONCLUSION

Thus, HIV infection caused a fall in the PCV levels of HIV infected pregnant women when their mean value was compared with the HIV seronegative pregnant women and the control. This value probably may suggest the presence of anaemia in these women.

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