World Journal of Medical Sciences 10 (4): 375-378, 2014
ISSN 1817-3055

DOI: 10.5829/idosi.wjms.2014.10.4.7651

Asymptomatic HIV Infection and its Impact on Some Haematological Parameters in Iwocommunity, Southwestern Nigeria

[1]C. Igbeneghu, [2]G.N. Odaibo, [2]D.O. Olaleye and [3]A.B. Odaibo

[1]Department of Biomedical Sciences,
Ladoke Akintola University of Technology, Ogbomoso, Nigeria
[2]Department of Virology, University of Ibadan, Ibadan, Nigeria
[3]Department of Zoology, University of Ibadan, Ibadan, Nigeria

Abstract: The current national HIV data in Nigeria is based on the HIV seroprevalence among pregnant women but only little is known about HIV prevalence among non-pregnant adults. There is need to determine HIV prevalence at community level to establish the actual status of the infection for effective control measures. In the present study, the prevalence of asymptomatic HIV among adults and its effect on some haematological parameters were determined. A total of 1688 adult volunteers (861 males and 827 females) in Iwo community, Southwestern Nigeria, who seemingly appeared healthy were screened for the study after informed consent. Antibodies to HIV were determined and haematocrit, haemoglobin concentration, total leucocyte and platelet counts were estimated using standard laboratory techniques. The prevalence of HIV in this study was 1.5%. Out of the 1688 subjects examined, 25 (1.5%) comprising 14 (1.7%) of 827 females and 11(1.3%) of 861 males were positive for HIV infection. There was no significant difference between the sexes ($x^2 = 0.47$; df = 1; $p > 0.05$). Mean values of haematocrit, haemoglobin concentration, total leucocyte and platelet counts were significantly lower ($p < 0.05$) in HIV infected subjects (31.5±5.0%, 110.0±17.0 g/dL, 2.9±0.6x10^9/L and 129.8±24.0x10^9/L) compared to non-infected subjects (38.8±4.1%, 134.0±14.0 g/L, 5.3±2.2x10^9 /L and 164.8±29.5x10^9 /L). Asymptomatic HIV prevalence rate among male and female adults is low in the study area and have significant negative impact on blood cells.

Key words: Asymptomatic HIV Infection · Prevalence · Blood Cells · Adults Volunteers · Iwo · Nigeria

INTRODUCTION

Human immunodeficiency virus (HIV) disease or Acquired immunodeficiency (AIDS) is a major public health problem in sub-Saharan African. However, many people when first infected with HIV do not show any signs and symptoms. They are considered asymptomatic; not aware that they have been infected but infectious to others. In 1991, the Federal Ministry of Health made its first attempt to assess the Nigerian HIV/AIDS situation by establishing the first HIV sentinel surveillance as a means of monitoring HIV/AIDS in the country. HIV prevalence increased from 1.8% in 1991 to 4.5% in 1995, 5.4% in 1999, 5.8% in 2001 and then decreased to 5.0% in 2003, 4.4 % in 2005, 4.2% in 2008 and 4.1% in 2010 [1]. HIV has been reported in all the states of the federation including Abuja and the prevalence rates vary significantly from state to state and from zone to zone [1]. These variations in HIV prevalence rates across the country explain the need to carryout regular epidemiological study at every community, ward, local area and state for effective control measures.

The current national HIV data is based on the HIV seroprevalence among pregnant women attending government health facilities and one major weakness associated with this is that only little is known about HIV infection among the general population. A community-based prevalence study carried out in Ibadan and Saki showed that HIV infection rate may be higher than previously suggested by the periodic national testing of

Corresponding Author: C. Igbeneghu, Department of Biomedical Sciences,
Ladoke Akintola University of Technology, Ogbomoso, Nigeria.

antenatal attendees [2]. Although cytopenias have been associated with HIV patients [3, 4], the impact of asymptomatic HIV infection on haematological parameters is not well known. The objectives of this study were to determine the prevalence of HIV and its effect on some haematological parameters in Iwo community, Southwestern Nigeria.

MATERIALS AND METHODS

Study Area and Subjects: The study was carried out in Iwo, a semi-urban community in Southwestern Nigeria. It is situated between Latitudes 7°37´30" and 7°38´30"N and Longitudes 4°10´30" and 4°12´00"S. A total of 1688 volunteers (861 men and 827 women) (≥ 16 years) with no clinical signs and symptoms of ill health as of the time of investigation were screened for the study after clinical examination and informed consent was obtained. Pregnancy test was performed to eliminate any doubt as to the pregnancy status of the female participants. Ethical approval for this study was obtained from the Ethical Committee of Ladoke Akintola University Teaching Hospital, Osogbo, Osun State, Nigeria.

Diagnosis of HIV: Antibodies to HIV were determined using Capillus rapid HIV 1/HIV 2 test kit (Trinity Biotech Plc, Ireland) and Enzyme linked immunosorbent assay (ELISA) (GenScreen plus HIV Ag-Ab test kit, Pasteur, Paris) and then confirmed with Western blot (WB) (New-LAV Blot 1, BioRad, France). Haematocrit, haemoglobin concentration, leucocyte and platelet counts were done using an automated Coulter counter STKS model.

Statistical Analysis: Continuous variables were expressed as mean ± standard deviation (S.D). Chi-square test was used to test for associations and differences between percentages and proportions. Student's t test was used to compare sample means. A p-value of < 0.05 was considered to be significant.

RESULTS

Out of the 1688 subjects examined, 25 (1.5%) comprising 14 (1.7%) of the 827 females and 11(1.3%) of the 861 males were positive for HIV infection. Twenty-two (88%) of the HIV positive subjects comprising 10 males and 12 females were below 40 years. Figure 1 showed the prevalence of HIV according to age and sex. The highest prevalence of HIV was observed in the 20-29 years age group for females and 30-39 years age group for males. There was no significant difference between the sexes ($x^2 = 0.47$; df = 1; p = 0.5) and among the age groupings ($x^2 = 4.91$; df = 3; p = 0.2).

Table 1 compared the haematological values of HIV subjects by sex. It showed that the mean values of the haematocrit, haemoglobin concentration, total leucocyte count and platelet count of HIV infected males (32.4±6.3%, 113.0±21.0 g/L, 2.8±0.6x10^9/L, 127.0±38.0x10^9 /L) and those of the HIV infected females (30.8±4.0%, 108.0±1.8 g/L, 3.0±0.6x10^9/L, 132.0±13.0x10^9/L) were not significantly different (p = 0.25, p = 0.24, p = 0.20 and p = 0.40 respectively). Table 2 compared the haematological values of subjects infected with HIV and those not infected. It showed that the mean values of haematocrit, haemoglobin concentration, total leucocyte and platelet counts in HIV infected

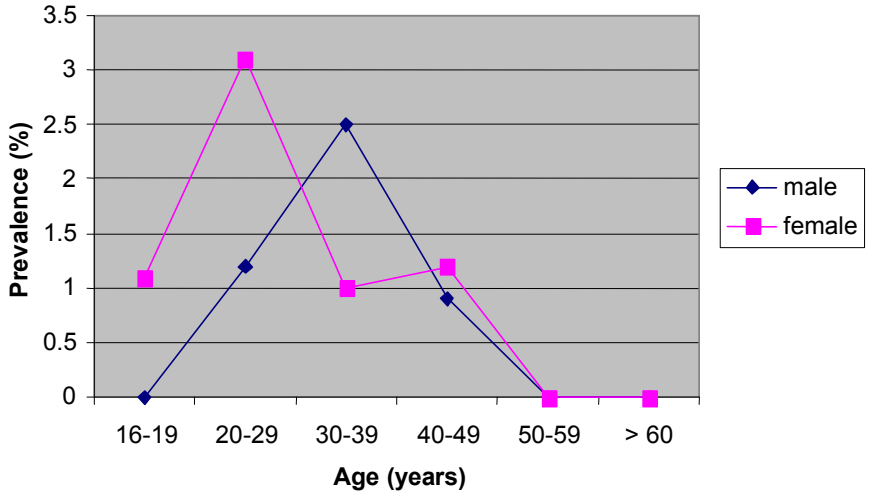

Fig. 1: Prevalence of HIV among the study participants in Relation to Age and Sex

Table 1: Comparison of Haematological Values of HIV Subjects by Sex

Parameter	Males n = 14 Mean±SD	Females n = 11 Mean±SD	p-value
Haematocrit (%)	32.4±6.3	30.8±4.0	0.25
Haemoglobin conc (g/L)	113.0±21.0	108.0±1.8	0.24
Total Leucocyte count (10^9/L)	2.8±0.6	3.0±0.6	0.20
Platelet count (10^9/L)	127.0±38.0	132.0±13.0	0.40

Table 2: Comparison between Haematological Values of HIV Subjects and Non-infected Subjects

Parameter	NIS n = 864 Mean±SD	HIV n = 25 Mean±SD	p-value
Haematocrit (%)	38.8±4.1	31.5±5.0	<0.001
Haemoglobin conc (g/L)	134.0±14.0	110.0±17.0	<0.001
Total Leucocyte count (10^9/L)	5.3±2.2	2.9±0.6	<0.001
Platelet count (10^9/L)	164.8±29.5	129.8±24.0	<0.001

NIS: Non-Infected Subjects- these are participants not infected with HIV infection.

subjects (31.5±5.0%, 110.0±17.0 g/L, 2.9±0.6x10^9/L and 129.8±24.0x10^9/L) were significantly lower than those of non-infected subjects (38.8±4.1%, 134.0±14.0 g/L, 5.3±2.2x10^9/L and 164.8±29.5x10^9/L) ($p < 0.001$, $p < 0.001$, $p < 0.001$ and $p < 0.001$ respectively).

DISCUSSION

The prevalence of HIV in this study was 1.5%. This result was lower than the National sentinel surveillance prevalence rate of 2.1% [1] for Osun State. The obtained result differed from a similar one carried out in Ibadan and Saki both in Oyo State [2] which showed that the actual HIV infection was higher than the national HIV survey prevalence rate for that State. The rate of HIV infection varies significantly from one location to another in Nigeria although there has been a general decrease in prevalence rate since 2001 (5.8% in 2001, 5.0% in 2003, 4.4% in 2005, 4.3% in 2008 and 4.1% in 2010) which has been attributed to the nationwide prevention campaigns [1, 5, 6].

Most HIV infections (88%) in the present study occurred among males and females between the ages of 20 and 39 years. Some previous studies have also shown that most infections were in men and women between similar age brackets [1]. The implication of this is a reduction in workforce and loss of productivity since people within this age bracket are in their most productive years and are suppose to advance the socio-economic development of the nation.

The ratio of infected males to females was 1:1 in this study. In Africa, the male to female ratio of HIV infection is approximately 1:1 [7, 8] which suggest that the main mode of transmission is heterosexual. In Nigeria, heterosexual transmission is the major mode of transmission accounting for about 80-95% of all transmissions [9]. According to Nasidi and Harry [5], both higher ratios of males to females and females to males have been previously reported with higher ratio of males to females more associated with early phases of the epidemic while as the HIV epidemic matures the ratio reverses and women are more affected.

The study showed that asymptomatic HIV infection had significant impact on haematological parameters. Subjects infected with HIV infection were anaemic (< 120 g/L) compared to non-infected subjects. The pathogenesis of anaemia associated with HIV infection is not fully understood but previous studies have suggested mechanisms such as direct viral effect [10, 11] and inhibition of bone marrow expression [12]. Thrombocytopenia (< 150x10^9/L) was observed among the HIV infected subjects in this study. Thrombocytopenia is said to be common at all stages of HIV and may result from marrow impairment, toxic drug effects or the effects of splenomegaly [13, 14]. Athough the mean leucocyte value of the HIV infected subjects was higher than the lower limit of the normal range (> 2.6x10^9/L), it was significantly lower than the mean leucocyte value of the control subjects. This reduction can be associated with impaired haematopoiesis together with immune neutrophil destruction which increases in incidence as HIV disease progresses [14].

CONCLUSION

The prevalence of asymptomatic HIV infection in Iwo community, Southwestern Nigeria is low and associated with anaemia and thrombocytopenia. Patients on routine full blood test with these conditions should, with appropriate counselling, be advised to perform HIV test.

Currently, there is a vibrant campaign against HIV in this locality. This should be sustained so as to further bring down its prevalence.

ACKNOWLEDGEMENTS

We are highly indebted to the managements and staff of the State, Bowen Baptist and Victory Hospitals all in Iwo for their assistance and support.

REFERENCES

1. FMOH, 2010. National HIV seroprevalance sentinel survey. Abuja: Federal Ministry of Health, Nigeria.
2. Olaleye, D.O., T.O. Harry and G.N. Odaibo, 2006. The virology and dynamics of the epidemic. AIDS in Nigeria: A nation on the threshold. Harvard center for population and development studies, Boston, Massachusetts, pp: 37-64.
3. Saif, M.W., 2001. HIV-associated autoimmune haemolytic anaemia: an update. AIDS Patient Care and STDs, 15(4): 217-224.
4. Erhabor, O., S. Babatunde and K.E. Uko, 2006. Some haematological parameters in Plasmodial parasitized HIV-infected Nigerians. Nigerian J. Med., 15: 52-55.
5. Nasidi, A. and T.O. Harry, 2006. The epidemiology of HIV/AIDS in Nigeria. AIDS in Nigeria: A nation on the threshold. Harvard Center for population and development studies, Boston, Massachusetts, pp: 17-36.
6. Utulu, S.N. and T.O. Lawoyin, 2007. Epidemiological features of HIV infection among pregnant woman in Makurdi, Benue State, Nigeria. J. Biosoc. Sci., 39(3): 397-408.
7. Olaleye, D., L. Bernstein, C.C. Ekweozor, Z. Sheng, S.A. Omilabu, L. Xiu-Yan, J. Sullivan-Halley and S. Rasheed, 1993. Prevalence of Human Immunodeficiency Virus type 1 and 2 infections in Nigeria. J. Infect. Dis., 167: 710-714.
8. Subbarao, S. and G. Schochetman, 1996. Genetic variability of HIV-1. AIDS., 10: 513-523.9.
9. NACA, 2010. United nations general assembly special session country progress report: Nigeria. Reporting Period January 2008-2009. National Agency for the control of AIDS, Nigeria.http:/data.unaids.org/pub/Report/2010/nigeria2010countryprogressreporten.pdf.
10. Callenda, V., P. Grabber, J.F. Delamater and J.C. Chermann, 1994. Involvement of HIV nef protein in abnormal haematopoiesis in AIDS-*in vitro* study on bone marrow progenitor cells. Eur. J. Haematol., 52: 103-107.
11. Davis, B.R. and G. Zauli, 1995. Effect of HIV infection on haematopoiesis. Bailliere's Clin. Haematol., 8: 113-130.
12. Fuchs, D., G. Reibnegger, E.R. Werner, H. Vinazzer and H. Wachter, 1991. Low haemoglobin in haemophilia children is associated with chronic immune activation. Acta Haematol., 85: 62-65.
13. Karpatkin, S., 1990. HIV-related thrombocytopenia. Bailliere's Clin. Haematol., 3: 115-138.
14. Costello, C., 1999. The haematological manifestations of HIV disease. Postgraduate Haematology. A.V. Hoffbrand, S.M. Lewis and E.G.D. Tuddenham. Eds. Butterworth Heinemann, Britain.