Original Research Article

Sero-Prevalence of Human Immunodeficiency Virus Among Students Undergoing Medical Examination in a Tertiary Institution

ABSTRACT

Aims: To assess the prevalence of human immunodeficiency virus among students undergoing medical checkupin a tertiary institution
Study design: The investigation utilised a cross-sectional study design technique.
Methodology: In this present study,2114participantswere included inthe age range 15-49 years.Serological method was used to detect the presence of HIV using a rapid diagnostic technique using determine. Tile method was used to determine the ABO and Rhesus D antigens in the individuals.
Results: Out of the 2114 participants sampled, the population studied according to various departments within the university were ME 95 (5%), EM 181 (9%), LIB 101 (5%), SPE 63 (3%), ENG 296 (14%), BIO 423 (20%), CHE 150 (7%), COM 305 (14%), MGT 236 (11%) and ACC 236 (12%). The prevalence of HIV among tertiary institution students is 1%.
Conclusion: This research gives an insight into the prevalence of HIV among students in tertiary institution for strategic intervention.

Keywords: Medical check, HIV, Student population

1. INTRODUCTION

The human immunodeficiency virus (HIV) is a chronic viral infectious disease that damages the immune system of the infected individual. It progresses to the development of Acquired Immune Deficiency Syndrome (AIDS) and death without proper medical attention (Jacobs et al., 2023). it is an enveloped lentivirus within the family Retroviridae. Its genetic material has a single nucleic acid structure which is known as an RNA virus (Tomezsko et al., 2020). HIV can be transmitted through direct inoculation into the bloodstream, or after contact and attachment through mucosal surfaces. It can also be transmitted through direct contact with a bodily fluid containing HIV such as blood, semen, vaginal fluid, and breastmilk (Azuonwu et al., 2012), the transmission could involve anal, vaginal or oral sex, blood transfusion, contaminated hypodermic needles, exchange between mother and child during pregnancy, childbirth or breastfeeding (Talarok and Talaro, 2002; Centre for Disease Control and prevention, 2003). An infection can result when the virus crosses the body epithelial barriers into the fluid compartments, due to the blood, semen, vaginal secretion of infected subjects, harbours high level of free virus and infected leukocytes, which are significant factors in sexual transmission pathway. Its mode of transmission is similar to other kinds of viral infection such as hepatitis, Ebola virus, Lassa fever virus.

HIV is a global health tragedy that has affected over 36.9 million persons in 2019 which translates to 0.5% of global population (Govender et al., 2021). In 2018, 20.6 million people in the southern and eastern Africa were living HIV and the western and central Africa was 5.0 million (WHO, 2019). Nigeria has the second largest number of people living with

HIV/AIDS in Africa accounting for 9.0% of the global burden with prevalence of 3.2%, and burden of 3.1 million people living with HIV(Endalamaw et al., 2020; Govender et al., 2021). This burden impacts negatively on the health system. Report of HIV research in Nigeria showed that Rivers State has the highest HIV prevalence (15.2%) among the states in the country(Awofala et al., 2018). The generalized prevalence of HIV is approximately 3.6% but there are significantly higher rates among most-at-risk-populations (MARPs) (Federal Ministry of Health, 2012). These MARPs include illicit intra-venous drug users, commercial sex workers and men who have sex with men.

Despite the high burden of HIV among residents within Nigeria, the level of testing and management is poor and varies among the different strata of Governments (Dwyer-Lindgren *et al*., 2019, Cuadros *et al*., 2017, Coburn *et al*., 2017). This variation occurs at the local government, state and national levels and could be a result of knowledge gap about transmission in addition to poor management strategies (O'brien-Carelli *et al*., 2019).

A large HIV population-based survey conducted in Nigeria demonstrated the relevance of geographic disparities across the healthcare settings [Nigeria 2018]. The study revealed a prevalence of 1.3% among individuals aged 15 to 49 years. This prompted the Nigerian government to revise its strategic framework by classifying states into focal point for identification and treatment of HIV/AIDS-infected persons (United states 2019).

In this study, we present the cross-sectional perspective of prevalence, at the grassroot level, of HIV among students undergoing medical examination in a tertiary institution. Majority of these students are between the age of 15 to 49.

2. METHODS

2.1 Study Area

This study was performed at the Ignatius Ajuru University of Education in Port Harcourt of Rivers State using students undergoing medical checkup as subjects.

2.2 Study Design

The study design employed in this research was cross-sectional design. The study sampled 2114 participants using simple random method which included both male and female sex. The sample size of 2114 was determined using the Cochrane formula with the prevalence of HIV at 15%.

2.3Sample Collection

After pre-test counselling and explanations, venous blood was drawn aseptically from the antecubital fossa of the subject with the use of vacutainer as described by Cheesebrough (2009).

2.4Determination of HIV Prevalence

The rapid diagnostic technique using Determine kit was used to detect the presence of HIV in subjects. The blood was allowed to coagulate thereby allowing the serum to separate. A drop of serum was added to the Determine strip. The presence of double bands indicates positive for HIV while a single band shows negative result.

2.5Determination of ABO and Rh-D Blood Group of Subjects

The serological method was employed to analyse the blood group of the subjects using the tile method.
For ABO and Rh-D blood group, a drop of anti-A, anti-B, anti-AB and anti-D (Atlas Medical), each was placed in the wells on the tile A, B, AB and O. A drop of red cell was added to the part labelled A, B, AB and O and anti A, anti-B, anti-AB and anti-D was dropped in the part labelled A, B, AB and O. This was mixed gently and rocked for about 30sec and observed for agglutination. Presence of agglutination indicated a positive result while absence of agglutination indicates a negative result.

2.6Data Analyses

This study data was presented as percentages. Chi-square analyses were performed where necessary.

3. RESULTS

The study sampled 2114 participants. Table 1 shows the age distribution of subjective from different departments. The highest number of persons sampled fall within the 15 to 25 age range group ME 85 (89%), EM 157 (87%), LIB 88 (87%), SPE 43 (68%), ENG 262 (89%), BIO 396 (94%), CHE 132 (88%), COM 262 (86%), MGT 197 (83%), and ACC 250 (95%). This was followed by the age range of 26 to 25years: ME 9 (10%), EM 14 (8%), LIB 13 (13%), SPE 15 (24%), ENG 33 (11%), BIO 27 (6%), CHE 18 (12%), COM 43 (14%), MGT 38 (16%), and ACC 14 (5%). The least population included in the study was within the age range of 35 to 45 years: ME 1 (1%), EM 10 (6%), LIB 1 (1%), SPE 5 (8%), ENG 1 (0%), BIO 0 (0%), CHE 0 (0%), COM 0 (0%), MGT 1 (1%) and ACC 0 (0%). The population studied according to various departments within the university were ME 95 (5%), EM 181 (9%), LIB 101 (5%), SPE 63 (3%), ENG 296 (14%), BIO 423 (20%), CHE 150 (7%), COM 305 (14%), MGT 236 (11%) and ACC 236 (12%).

Table 1. Age Distribution of Subjects from Different Departments

Age Range	ME n(%)	EM n(%)	LIB n(%)	SPE n(%)	ENG n(%)	BIO n(%)	CHE n(%)	COM n(%)	MGT n(%)	ACC n(%)
15-25	85 (89)	157 (87)	88 (87)	43 (68)	262 (89)	396 (94)	132 (88)	262 (86)	197 (83)	250 (95)
26-35	9 (10)	14 (8)	13 (13)	15 (24)	33 (11)	27 (6)	18 (12)	43 (14)	38 (16)	14 (5)
35-45	1 (1)	10 (6)	1 (1)	5 (8)	1 (0)	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)
Total	95	181	101	63	296	423	150	305	236	264

**ME – Marketing Education, EM – Education Management, LIB – Library and Information Science, SPE -Special Unit, ENG – English, BIO – Biology, COM – Computer, MGT – Management, ACC – Accounting*

Table 2 shows the sex distribution of the sampled populations according to males and females are: ME 29 (31%), 66 (69%), EM, 56 (31%), 125 (69%), LIB 27 (27%), 74 (73%), SPE 21(33%), 42 (67%), ENG 37 (13%), 259 (87%), BIO 71 (17%), 352 (83%), CHE 50 (33%), 100 (67%), COM 64 (21%), 241 (79%), MGT 64 (27%), 172 (73%), and ACC 62 (23), 202 (77%).

Table 2. Sex Distribution of Subjects from Different Departments

Departments	Male n(%)	Female n(%)	Total n(%)
ME	29 (31)	66 (69)	95 (4)
EM	56 (31)	125 (69)	181 (9)
LIB	27 (27)	74 (73)	101(5)
SPE	21(33)	42 (67)	63 (3)
ENG	37 (13)	259 (87)	296 (14)
BIO	71 (17)	352 (83)	423 (20)
CHE	50 (33)	100 (67)	150 (7)
COM	64 (21)	241 (79)	305 (14)
MGT	64 (27)	172 (73)	236 (11)
ACC	62 (23)	202 (77)	264 (12)

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Table 3. Prevalence of Blood Group Distribution of Subjects from Different Departments

Departments	O^+ n(%)	O^- n(%)	A^+ n(%)	A^- n(%)	B^- n(%)	B^+ n(%)	AB^+ n(%)	AB^- n(%)	Total n(%)
ME	60	2	17	2	0	13	1	0	95 (4)
EM	98	6	50	1	0	25	1	0	181 (9)
LIB	53	3	25	0	0	15	4	0	101(5)
SPE	46	2	9	0	1	3	2	0	63 (3)
ENG	158	10	72	2	3	46	5	0	296 (14)
BIO	229	16	108	1	1	62	6	0	423 (20)
CHE	103	3	20	3	0	15	6	0	150 (7)
COM	168	10	68	1	0	54	4	0	305 (14)

MGT	150	7	40	1	1	36	1	0	236 (11)
ACC	144	14	65	3	1	35	2	0	264 (12)
Total	1209	73	474	14	7	304	32	0	

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Table 4. Prevalence of HIV among Subjects across Different Departments

Departments	Positive n(%)	Negative n(%)	Total n(%)
ME	1 (1)	94 (99)	95 (4)
EM	5 (3)	176 (97)	181 (9)
LIB	2 (2)	99 (98)	101(5)
SPE	0(0)	63 (100)	63 (3)
ENG	1 (0)	295 (100)	296 (14)
BIO	5 (1)	418 (99)	423 (20)
CHE	1 (1)	149 (99)	150 (7)
COM	2 (1)	303 (99)	305 (14)
MGT	3 (1)	233 (99)	236 (11)
ACC	2 (1)	262 (99)	264 (12)
Total	22	2092	

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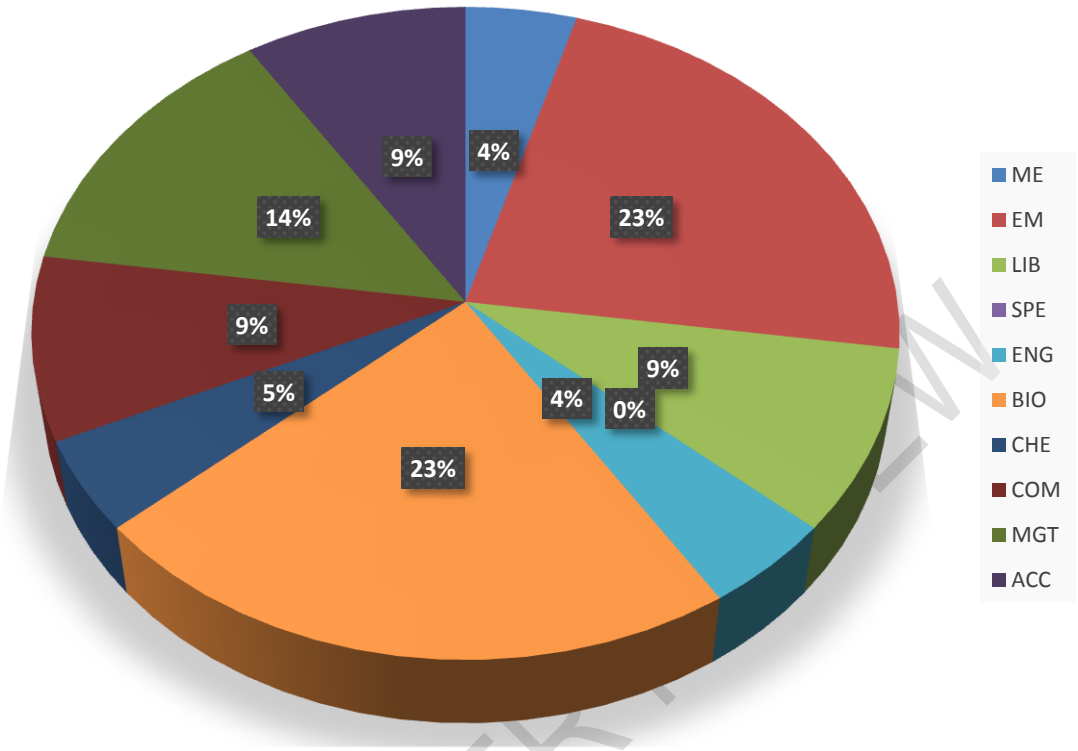

Figure 1 Prevalence of HIV

HIV Prevalence across Blood Groups

Departments	O^+ n(%)	O^- n(%)	A^+ n(%)	A^- n(%)	B^- n(%)	B^+ n(%)	AB^+ n(%)	AB^- n(%)	Total n(%)
Prevalence %	0	2	4	5	3	2	2	4	22

4. DISCUSSION

Our study comprehensively provides the prevalence of HIV among students undergoing regular medical examination. Complete reliance on national data does not portray the exact prevalence of HIV infection within every region of the country. Hence, the study assessed the prevalence of HIV and the associated ABO blood grouping for individuals attending a tertiary institution.

The prevalence of HIV in the study is 1%. This is two times higher than the global prevalence as of 2019 (WHO, 2019). Part of the reason for this phenomenon is the low level of awareness within Rivers State of Nigeria. The prevalence of HIV is also lower than the current national prevalence which is 1.8% (Onovo et al., 2023).

The major role of ABO blood grouping is the prevention of transfusion reactions; however, some studies have associated it with the presence of some infectious diseases (Cooling, 2015; Anstee, 2010). The prevalence of HIV was highest in A^- followed by AB^-. This

observation opposed the study by Jacobs et al. (2023) which demonstrated higher prevalence in Rhesus positive individual.

The findings of this study highlight the importance of understanding the prevalence of HIV among students in tertiary institutions. The sero-prevalence rate observed underscores the need for targeted interventions, including HIV education, counseling, and testing services, within this population. The identification of associated risk factors can inform the development of comprehensive prevention strategies tailored to the specific needs of students. Limitations of the study, such as sampling bias is evident due to the location. Future research should explore longitudinal studies to monitor trends in HIV prevalence among students and evaluate the effectiveness of interventions aimed at reducing HIV transmission risk.

Finally, this study contributes to our understanding of the sero-prevalence of HIV among students undergoing medical examination in a tertiary institution. The findings underscore the importance of proactive measures to address HIV transmission risk factors and promote the health and well-being of students. Efforts to enhance HIV prevention and support services within tertiary institutions are crucial in mitigating the impact of HIV on young adults and fostering a healthy campus environment.

5. CONCLUSION

The study demonstrates that the prevalence of HIV according to the departments at Ignatius Ajuru University of Education are ME 1 (1%), EM 5 (3%), LIB 2 (2%), SPE 0(0%), ENG 1 (0%), BIO 5 (1%), CHE 1 (1%), COM 2 (1%), MG 3 (1%) and ACC 2 (1%). The average prevalence of the study was 2.2 in 2114 or 0.0.

CONSENT

All authors declare that written informed consent was obtained from the subjects. A copy of the written consent is available for review by the Editorial office of this journal.

ETHICAL APPROVAL

Ethical approval was obtained from the (ethical committee of Health Services Department, Ignatius Ajuru University of Education, Port Harcourt)

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