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Should Pre-admission Medical Tests to Tertiary Institutions Include Screening for Syphilis?

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Authors' contributions

This work was carried out in collaboration between all authors. Author FAO designed the study, wrote the protocol and the first draft of the manuscript. Author DOF managed the literature searches and performed laboratory analysis. All authors read and approved the final manuscript.

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Original Research Article

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ABSTRACT

Background: This study was conducted to determine the seroprevalence of syphilis among apparently healthy students of Adekunle Ajasin University, Akungba-Akoko in Ondo State of Nigeria with the view of advising the University authority to include (or otherwise) the screening for syphilis among the routine tests for pre-admission registration.

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Methodology: A well-structured questionnaire was administered to assess the knowledge of volunteers about syphilis. Venous blood samples (5ml) were then collected from 1545 volunteers and screened using the Rapid Plasma Reagin (RPR) test. All seropositive samples were further confirmed using the *Treponema pallidum* Haemaglutination (TPHA) test.
Results: Ninety three per cent (93.0%) and 73.3% of the volunteers agreed that syphilis affects both sexes and are sexually transmitted respectively. A prevalence rate of 1.1% was recorded in the study with 12(70.6%) seropositive male out of the seventeen (17) seropositive cases detected. No seropositive case was detected among the control group.
Conclusion: Though the prevalence was low, for the sake of the control group who lives in the same vicinity with the volunteers and perceived increase in prevalence, it is strongly suggested that all students and newly appointed staff should be screened for Syphilis as a routine for pre-admission and pre-employment exercises.

Keywords: Syphilis; T. pallidum; Prevalence; AAU; School; Pre-admission screening; Akungba-Akoko.

1. INTRODUCTION

Syphilis is an infectious disease often transmitted through sexual activity andprimarily caused by a spirochaete called *Treponema pallidum* [1]. It is one of the most common sexually transmitted infections in Nigeria. Other routes of transmission, apart from sexual, include vertical transmission, contamination from blood products and through use of intravenous drugs [2,3]. Development of painless ulcer (chancre) usually located on the external genitalia in women and on the penis and scrotum in men is a symptom of primary stage of syphilis. If untreated, rash over the body, severe neurological dysfunction and heart problem could develop [4]. Sexually transmitted infections (STIs) have continued to be a major health problem in Sub-Saharan Africa especially with the recent resurgence of syphilis [3]. Epidemiological studies have shown that STIs including syphilis are associated with an increased risk for HIV transmission among both homo- and heterosexual people [5]. In Nigeria, studies have been carried out regarding syphilis infection in pregnancy [5,6], as co-infection among Human Immunodefiency Virus seropositive persons [7,8], among blood donors [9,10], among apparently healthy students of tertiary institutions [2,11] and among Nigeria paramilitary agencies [12]. In India, high prevalence rate of 5.7% was recorded among students [13]. A large population of the University community is made up of youths who are in most cases sexually active. They often engage in casual and unprotected sex. Casual sex has been reported to be higher among male students than their female counterpart who often does this for material possession [14]. There is paucity of published information on studies of syphilis infection among undergraduates of AAU, Akungba-Akoko. This study was therefore designed to determine the seroprevalence of syphilis among these students and be able to advice the University Health Center about relevance or otherwise of including screening for syphilis among pre-admission screening tests for students.

2. MATERIALS AND METHODS

2.1 Study Area

The study was done among students of Adekunle Ajasin University, Akungba-Akoko in the South western part of Nigeria. The entire students' population of the University was about

10,000 and the study was done between March and September, 2013. One thousand, four hundred and five (1405) Students gave verbal consent after they have been adequately informed and verbal approval given by the Director of Health Services of the University. Another 140 members of Akungba-Akoko community and members of staff of Adekunle Ajasin University, living in the same vicity and having similar social background were recruited into the study after giving their consent verbally to participate. This served as the control group. A minimum sample size was calculated using the formula for cross sectional survey:

$$N= (zi-a)2(p)(1-p)/ǯ2$$

Where N = minimum sample size
(zi-a)2 = constant at 95% confidence interval (1.96)
p = highest proportion of volunteers
ǯ = precision allowed (5%) [15]

2.2 Administration of Questionnaire

A simple but well-structured questionnaire which was designed to determine the knowledge of the volunteers about syphilis and to know whether any volunteer has history of sexually transmitted disease (STD) was given to each of the volunteers to fill.

2.3 Screening for Syphilis

Venous blood samples (approximately 5ml) were collected through venepuncture under asceptic condition using sterile disposable syringe into sterile screw capped tubes. The blood samples were centrifuged and the separated sera were stored at 4ºC. These were used for the Rapid Plasma Reagin (RPR)test using Diastop USA (Lot: SYP9070002) kits. Positive samples were further tested for specific antibody with the *Treponema pallidum* Haemagglutination (TPHA) test. The unused blood samples were buried at the University's dumping site. A volunteer is declared positive for active syphilis only when the sample is positive to both RPR and TPHA tests. Volunteers with active syphilis were referred to a nearby health facility for treatment.

2.4 Statistical Analysis

Data generated from the administered questionnaires were analysed using descriptive statistical methods (counts, percentages) while those from the screening test were analysed using Chi-square for 2 by 2 tables.

3. RESULTS

The average age of the volunteer students was 23.5±1.7 years while that of the control group was 39.1±2.3 years. Majority (73.3%) of the volunteers agreed that syphilis is sexually transmitted and 93% agreed that they occur in both sexes. However, only 45 (2.9%) agreed to having history of STD as shown in Table 1.

The prevalence of syphilis among the studied population was 1.1% the highest prevalent rate of 1.4% was found among the Stalites, 0.8% among the Freshers while 0.0% was recorded among the control group. The gender distribution showed that 10 (0.6%) males and

7 (0.5%) females were seropositive for syphilis as shown in Table 2. There was a statistical difference (X^2=0.815) between the seropositive male and female within the Stalite group. All volunteers with active syphilis were referred to a nearby health facility for treatment.

Table 1. Volunteers' knowledge about syphilis

Knowledge	Yes respondents (%)	No respondents (%)
Sexually transmitted	1132(73.3)	413(26.7)
Caused by *T. pallidum*	451(29.2)	1094(70.8)
Caused by witches/wizards	335(21.3)	1210(78.7)
Occur in both sexes	1437(93.0)	108(7.0)
Detectable through lab. tests	871(56.4)	674(43.6)
Can be treated	871(56.4)	674(43.6)
Previous history of STD	45(2.9)	1500(97.1)

n=1545

Table 2. Seropositivity of syphilis among the studied groups and according to gender distribution

Sex no tested	No pos(%)	X^2 value	Df	Crit. P-value(0.5)	Comment
Freshers					
Male 294	2(0.68)				
		0.125	1	0.455	Not signif.
Female 207	2(0.97)				
Sub-total 501	4(0.80)				
Stalites					
Male 444	8(1.80)				
		0.815	1	0.455	Significant diff.
Female 460	5(1.07)				
Sub-total 904	13(1.40)				
Control group					
Male 64	0(0.0)				
Female 76	0(0.0)				
Sub-total 140	0(0.0)				
Grand total 1545	17(1.1)				

4. DISCUSSION

Syphilis remains one of the major sexually transmitted diseases in the developing countries of the world. Knowledge of the disease is paramount to any strategic plan for its control. In this study, volunteers know that syphilis is sexually transmitted (73.3) and that it affects both sexes (93.0%). This knowledge is impressive as it is supposed to guide people about proper attitude toward sexual activities which include abstinence, staying with one sexual partner or use of condom as protective agent no matter their sexes. The responses of over half of the volunteers (56.4%) shows that infected individuals can readily come out for treatment at appropriate centers, a major step in control of infectious diseases. However, among this sexually active group, only 2.9% agreed to have a history of sexually transmitted disease, though the prevalence of STIs including syphilis has been reported to be high among teenagers in the United States who are responsible for one-fourth of more than 15 million new cases diagnosed each year [16]. The low confession among the studied group may

hinder access to adequate counsel on the danger of further exposure which can lead to more serious infections like HIV and thus hindering efforts aimed at controlling the disease. There is great need for awareness campaign at every opportunity by qualified health personnel on the cause of syphilis and by extension many other sexually transmitted diseases, as 21.3% of volunteers in this study still believed that syphilis is caused diabolically.

The seroprevalence of syphilis among the volunteers in this study is 1.1%. This is similar to results of other studies. Olokoba et al. [10] and Fiekumo et al. [9] reported 1.2% and 1.1% prevalence rate among blood donors in the same country respectively. In China, a prevalence rate of 0,36% was reported by Yaozhen et al. [17]. Nwokedi et al. [12] reported 5% prevalence among paramilitary agencies in Nigeria while Lamina et al. [6] reported 2.4% prevalence among pregnant women. An unusually low prevalence (0.5%) was reported among HIV patients in Nigeria. However, the result from this study was at great variance with two similar studies conducted in tertiary institutions in Benin (15.4%) and Ekpoma (15.2%) in the South Eastern part of Nigeria. The socio-economic life of people in these cities with heavy impart of Oil Company workers might be responsible for the high prevalence compared to the semi-urban city status of Akungba-Akoko where this study was carried out. This is not in agreement with some studies that show a higher prevalence in population with lower socio-economic status [18]. Among the Freshers with the prevalence rate of 0.8%, a male-to-female ratio of 1:1 was reported while 1.4% prevalence with 1.6:1 ratio was reported among the Stalites. This further confirms that male students are more involved in casual and unprotected sex than their female counterparts [14]. However, Akamana [19] reported that Females had higher prevalence rate (4.5) compare to their male counterpart (2.0%) in a recent study in Nigeria. High prevalence rates (4.5%, 9.1% and 22.4%) were equally reported in females by Hwana et al. [20] Todd et al. [21] and Sule et al. [22] respectively. The increase prevalence among older students (stalites) showed a continuous dissemination of infection which needs to be curtailed through regular surveillance like this especially at the point of entry (registration for admission) and monitored through the course duration. Screening of all students is encouraged. Seropositive individuals with active infection should be treated as a control measure. This study provides documented evidence to encourage inclusion of screening for syphilis infection among other laboratory tests done for pre-admission in Adekunle Ajasin University, Akungba-Akoko and by extension in all Nigerian tertiary institutions.

5. STUDY LIMITATION

The few that declined been recruited might know their syphilis status, thereby reducing case detection.

6. CONCLUSION

This study revealed a seroprevalence of 1.1% among the studied students' population. Since syphilis is sexually transmitted we strongly recommend that all students and newly appointed staff should be screened for Syphilis as a routine for pre- admission and pre-employment exercises. This study equally served as a baseline for future researches among this population.

CONSENT

Not applicable.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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