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Prevalence and Attitude towards *Trichomonas vaginalis* infection among undergraduate students of a higher institution in South Eastern Nigeria

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ABSTRACT

A study to determine the prevalence and attitude towards *Trichomonas vaginalis* infection amongst undergraduate students of a higher institution in south Eastern Nigeria was conducted between January and June 2015. A total of 250 students comprising of 104 males and 146 females had their urine samples examined using the microscopy method for the presence of *Trichomonas vaginalis*. A structured questionnaire was used to collect data from all the consenting participants after which high vaginal swabs were collected, processed and examined for *T. vaginalis* using microscopy. Out of this number, 40 (16%) were infected. Age related infection rate was highest in the 31 – 35 years (25%) age group. Symptoms associated with this infection included genital discharges, painful urination, painful menstruation (dysmenorrhea), itching, and irregular menstruation. Factors which affect the student's attitude towards getting screened for the infection are fear, ignorance, poverty, self-medication, lack of time and even carelessness. Possible causes of *T. vaginalis* infection were revealed as: sharing of towels (10.0%), sharing of bathing sponge (6.0%), sharing of under wears (5.2%), unclean or infected toilet facility (2.0%). sharing of shaving sticks, razor blade and scissors (for pubic hair) (1.2%) and unprotected sex (0.8%). Known preventive measures against *Trichomonas vaginalis* infection included avoidance of sexual contact with infected persons (2.8%), use of condoms (32.8%), avoidance of premarital sex (9.2%), having only one sexual partner (12.8%), disinfecting and keeping the toilet clean (17.2%) and not sharing towels (6.0%). Public health enlightenment that is targeted at behavioural change is strongly advocated.

Keywords: Prevalence, *Trichomonas vaginalis,* Symptoms, Umudike, Undergraduate

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1 INTRODUCTION

Trichomoniasis is an infection caused by *T. vaginalis* that is found in vaginal secretions. *T. vaginalis* is a cosmopolitan protozoan parasite affecting the urinogenital systems of men and women throughout the world (WHO, 2013). It is one of the most common causes of vaginal discharge. On a global scale, *T. vaginalis* is the most common non- viral sexually transmitted infection, also a neglected parasitic infection (Menezes et al.,2016). An incidence of 276 million new cases due to *T. vaginalis* has been reported worldwide, while a prevalence of 187 million infected individual within the ages of 15 and 49 years old are reported on a yearly basis (WHO, 2012; Royley et al.,2019). The global prevalence of trichomoniasis is much higher than other curable sexually transmitted infections such as gonorrhoea and syphilis.The normal habitat of the parasite is the human vagina, prostrate and urinary tract of both males and females. *T vaginalis* infection is considered to be a venereal disease because it is transmitted primarily through sexual intercourse. Sexually active individuals are usually found in higher institutions of learning (Usanga et al*.,*2020; Lawrence et al., 2021). Reports on the prevalence of *T. vaginalis* amongst undergraduate students have been reported in South Western part of Nigeria (John et al*.*,2017), South South zones of Nigeria (Isaac et al.,2019), northern part of Nigeria (Anosike et al*.,*1993) and south eastern parts of Nigeria (Njoku et al.,2007; Usanga et al.,2020). *T. vaiginalis* is an important health challenge among sexually active individuals and hence the need for adults to be aware of the infection. However, information on the current status of the infection among undergraduate students in higher institutions in Abia State is lacking. The present research is aimed at ascertaining the prevalence of *T. vaginalis* amongst undergraduate students of a higher institution South Eastern Nigeria.

2 MATERIALS AND METHODS

2.1 Study Area

The study was carried out in a higher institution located in Umudike, Ikwuano Local Government Area of Abia State,Nigeria. Umudike is a sub urban community, found between longitudes $7^{0}00^{1}$ and $33^{0}00^{1}$E and latitudes $5^{0}\ 00^{1}$ and $29^{0}\ 0^{1}$N. The study area has a tropical climate. The dry season begins in November and ends in February while the rainy season starts in March and ends in October. The total annual rainfall ranges from 1800 – 2190mm and the mean daily air temperature ranges from 22C to 33C. The average relative humidity is about 80% with up to 85% occurring during the rainy season. Residents of this area are mainly civil servants, farmers, petty traders and causal workers. The prevailing environmental factors (warmth and moisture) in the study area favours the survival of *T. vaginalis* (Lawrence and Okosa,2021)

2.2 Ethical Considerations

Ethical clearance was obtained from the Director of the Medical Centre of the Institution before commencement of the study. The research protocols were carefully explained to the individuals and informed consent obtained from each undergraduate student before being included in the study. Ethical Research Committee, College of Natural Sciences, Michael Okpara University of Agriculture Umudike gave approval for the study (Ref No:CREEC/005/ 21).

2.3 Study Population

Two hundred and fifty (250) undergraduate students made up of 104 males and 146 females who visited the University Medical Centre between January and June, 2015 constituted the study population.

2.4 Sample Collection and Examination

Urine samples, urethra swabs (from males) and high vaginal swabs (from females) were used to screen for *T. vaginalis.* A total of 250 urine samples from both male and female aged 16-35 years, 104 urethral swab (from males), and 146 high vaginal swabs (from females) were collected using well labelled sterile screw capped urine bottles and labelled vaginal and urethral sticks. All the samples we were collected at the University Health centre and transported to Parasitology laboratory of Department of Zoology and Environmental Biology. The research team carried out the whole exercise. Structured questionnaires were distributed to the respondents using closed ended questions to obtain information relating to age, marital status, sex and sexual behaviours among others. One mil of the urine samples from each participant was transferred into centrifuge tubes and then spun for five minutes at 3,500 revolutions per minute(rpm). After that, the supernatant fluid was decanted and the sediment placed on a microscopic slide, covered with a cover-slip and observed carefully under the microscope using ×10 and ×40 objectives (Adebayo,1986) cited in Lawrence *et al*., 2021.One drop of normal saline was added to each container of both vaginal and urethra swap and mixed thoroughly to form a homogenous mixture. A drop of the mixture was placed on a slide with a cover slip placed on it and examined under a light microscope, using ×10 and ×40 objectives. The presence of one or more trichomonads with its characteristic morphology and jerky motility confirms a positive result (Cheesbrough,1999).

3 RESULTS

A total of two hundred and fifty (250) undergraduate students of a higher institution in Umudike made up of 104 males and 146 females age 16-35 years had their urine samples examined microscopically for the presence of *T. vaginalis* trophozoites. Out of this number, (16.0%) were infected (Table 1). The age group 31-35 years recorded the highest rate of infection (25.0%) followed by the age group 21-25 years (16.67%) and 26-30 years (16.0%) (Table 2). More females (20.55%) than males (9.6%) were infected (Table 3). Ignorance (48.0%), fear (32.0%) and self-medication (32.0%) were some of the factors that affected the student's attitude to participate in laboratory tests for triochomoniasis (Table 3). Symptoms present included painful urination (25.8%), painful menstruation (dysmenorrhea) (21.8%) and genital discharges (9.9%) (Table 4). Possible causes of infection were attributed to sharing towels (10.0%) and bathing sponges (6.0%) (Table 5). The preventive measures against *T. vaginalis* infection included not sharing towels (49.2%), use of condoms (32.8%), disinfecting and keeping the toilet clean (17.2%), having only one sex partner (12.8%),avoidance of premarital sex (9.2%) avoidance of sexual

contact with infected persons (2.8%), (Table 6).

Table 1: Age Related Prevalence rate of *Trichomonas vaginalis* Infection Among Undergraduate Students (n=250)

Age (years)	No Examined	No Infected	Percentage Infection (%)
16-20	70	9	12.7
21-25	120	20	16.7
26-30	40	6	15.0
31-35	20	5	25.0
Total	250	40	16.0

Table 2: Gender-Related Prevalence of *Trichomonas vaginalis* Infection(n=250)

Gender	Number examined	Number Infected	Percentage of Infection (%)
Male	104	10	9.62
Female	146	30	20.5
Total	250	40	16.0

Table 3: Factors Affecting Student's Attitude Towards *Trichomonas vaginalis* Infection.

Possible factors	No of Respondents
Ignorance	120 (48.0%)
Fear	80(32.0%)
Poverty	50(20.0%)
Carelessness	65(26.0%)
Lack of information	55(22.0%)
Self-medication	80(32.0%)
No response	45(18.0%)

Table 4: Symptoms Associated with *Trichomonasis vaginalis* Infection in Undergraduate Students

Symptoms	No of Respondents
Discharges	25(9.9%)
Painful urination	65(25.8%)
Painful menstruation (Dysmenorrhea)	55(21.8%)
Itching	32(12.7%)
Irregular menstruation	38(15.1%)
No response	37(14.7%)

Table 5: Possible Causes of *Trichomonas vaginalis* Infection Among Undergraduate Students

Causes	No of Respondents (n%)
Unprotected sex	2(0.8%)
Sharing of shaving stick, razor blade and scissors (for pubic hair)	3(1.2%) 15(6.0%)
Sharing of bathing sponge	25(10.0%)
Sharing of towels	13(5.2%)
Sharing of underwears	5(2.0%)
Unclean or infected toilet facility	53(21.2%)
No response	0

Table 6: Preventive Measures Against *Trichomonas vaginalis* Infection Among Undergraduate Students

Preventive measures	No of Respondents n(%)
Avoidance of sexual contact with infected person	7(2.8%)
Use of condoms	
Avoidance of premarital sex	82(32.8%)
Having only one sex partner	23(9.2%)
Disinfecting and keeping the toilet neat and clean	32 (12.8%)
Not sharing towels	43(17.2%)
No response	
	123(49.2%)
	15(6.0%)

4 DISCUSSSION

Trichomoniasis is of public health importance in Nigeria. A prevalence rate of 16.0% among undergraduate students was observed in the present study in tandem with the result of Eze and Edwin (2020) who also reported a 16% prevalence amongst female students of University of Portharcourt. A lower prevalence rate of 12.5% was obtained amongst undergraduate students of Babcock University Ilishan-Remo, Ogun State (John et al., 2017). A much lower rate (1.7%) was obtained by Isaac et al.,(2019) amongst undergraduate students in various higher institutions of learning in Edo State. Anosike et al.,(1993) however obtained a higher prevalence of 24.7% amongst undergraduate students of a University in Northern Nigeria. The findings of this work reveal that trichomoniasis is prevalent among undergraduate students of this higher institution in Umudike. This is of great public health concern to the institution and the country at large, since these students share toilet facilities with other students. In addition they come from different homes and relate to different people outside the campus creating room for possible spread of the infection given that non-sexual transmission of *T. vaginalis* can occur through formites such as toilet seats, swimming pools and wet towels. The prevalence of *T. vaginalis* could be as a result of ignorance of the infection among the students, sharing of towels, unprotected sex and poor personal hygiene and among others. Age related infection showed that the highest prevalence of infection of 25.05% was observed in the group 31-35 years while the least infection rate was in the age group 16-20 years (12.9%). This is similar to the findings of John et al.,2017 amongst undergraduate students of Babcock university, Ilishian- Remo, Ogun State, where persons of 29 years and above had the highest prevalence (25%). The result however differed from the report of Eze and Edwin (2020) amongst undergraduate students of University of Port Harcourt who reported the highest prevalence amongst the age group of 15-25 years (17.2%). The difference could be as a result of the fact that the age range 31-35 years are usually in the period of greatest sexual activity and so are promiscuous and so prone to sexually transmitted diseases. The low infection rate in the age group 16-20 years could be associated with their non-sexually active life pattern. Parental upbringing, religious belief, exposure rate may also have contributed to the low rate of infection in this age group.

Gender wise, more females (20.55%) than males (9.62%) were infected. This is similar to the findings of Wokem (2006). Higher prevalence of infection has been reported among women than men. There was a significant difference in the prevalence of infection between the male and female students ($p>0.05$). Attitude towards sexual activities and poverty are high risk factors that contribute to the cause of this infection. These female students could not have been exercising caution or may have been pushed into prostitution or keeping multiple sex partners in order to make money to sustain themselves in the University. Some could be using oral contraceptives in order to prevent pregnancy. Poor personal hygiene and poor sanitary behaviours could also constitute risk factors as transmission could occur through vaginal contamination of toilet seats, water of toilet bowls and sharing of towels and underwear (Akinbo and Orosaye,2017).The low turnout of the students to be tested for the presence of *T. vaginalis* could be attributed majorly to ignorance (lack of adequate knowledge of the infection) (48.0%) fear (32.0%) and self-medication (32.0%) which calls for health education. More students would probably have availed themselves for the test if they had adequate knowledge about the infection. Some of the symptoms reported by respondents were genital discharge (9.9%), painful urination (25.8%), dysmenorrhea (21.8%), vaginal itching (12.7%) and irregular menses (15.1%) (Table 4). In a similar study, trichomoniasis has also been associated with vaginal and penile discharge which is odorous. vaginal itching, pain or burning sensation during intercourse, pain and or burning sanitation during urination (Usanga *et al*.,2020). Possible causes of trichomonas reported by the respondents included unprotected sex (0.8%), sharing shaving stick, razor blade and scissors (1.2%), sharing of under wears (5.2%), unclean and infected toilet (2.05%), sharing of towels (10.0%) (Table 5). These concur with reports by previous authors (Wokem,2007; Akinbo and Oronsaye,2017). Suggested preventive measures include, avoidance of sexual contact with infected persons (2.8%), use of condoms (32.8%), avoidance of premarital sex (9.2%), having only one sex partner for the married (12.85%), disinfecting and keeping the toilet clean (17.2%) and not sharing towels (49.2%). These preventive measures if adhered to could go a long way to curb the infection.

4.1 CONCLUSION

From the findings of this study, it is evident that Trichomoniasis has a high endemicity level among male and female undergraduate students of Michael Okpara University of Agriculture, Umudike. The results have also shown that the sexually active age group of 31-35 years had the highest prevalence of the infection with more females than males being infected. Prevalence of infection could be attributed to promiscuity, poor personal and sanitary hygiene, fomites transmission through sharing of sponges, shaving instruments and towels. In tertiary institutions of learning, adequate treatment, prevention and prophylactic measures amongst students should be strictly ensured to control this infection. The findings also highlight the need for health education targeted on behavioural change amongst students of higher education.

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