

Trichomonas vaginalis infection in male adolescents in parts of south eastern Nigeria

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Abstract: Background: *T. vaginalis* infection is present in the males where they may produce signs and symptoms. From two popular laboratories, one in Enugu and the other in Onitsha (Enugu and Anambra States), 361 consecutive young men was voluntarily enrolled into a study. Some were symptomatic and others were not. Urine, urethral smears and semen were collected and first directly examined under the light microscope, then cultured. Ethical clearance was obtained. Statistical analysis used were Simple Proportion tested by Chi Square

Results: By Direct examination and by Culture, *T. vaginalis* was isolated in 25.2% of the population. This was mainly in traders and bus drivers / bus conductors. Only a few were secondary school students. Adolescents aged 15 to 18 years formed 11.3%.

Conclusion: Males also harbor *T. vaginalis* infection in Nigeria. Therefore identification of the infection in females where it is relatively simpler to do so, calls for contact tracing in male partners for the relatively easy treatment in the couple(s). This may possibly assist in the prevention of the negative reproductive health consequences that may result.

Keywords: Male adolescents, STIs, *T. vaginalis*, contact tracing

I. Background:

In this country, Nigeria, as in some other developing countries of the world, *T. vaginalis* infection has only been identified in females only. Over 175million cases of *T. vaginalis* STI [1] described world-wide left the impression that it is a female problem having been described in females only. Its infection is said to facilitate HIV transmission [2] in both sexes. Symptoms of PID, cervical neoplasia and vaginitis, of itchy yellowish-green vaginal discharge and signs of vaginal alkaline environment (from 3.8-4.2 to 5-6) are more clearly defined in females. In the males, it can lead to epididymitis, infertility and aggressive prostatic cancer [3]. Sensitive laboratory tests for diagnosis required for males make it more difficult especially in developing countries like Nigeria. An editorial reported *T. vaginalis* as being the most prevalent non-STI in the USA and the world today [4]. Before now, studies were done on females in the south east Nigeria and showed incidence rates of 4.5-45% [5]. The present study was carried out among sexually active adolescent males to make the point of male infection and possibly assist in the prevention of the serious negative reproductive health consequences of *T. vaginalis* in this vulnerable group in the area.

II. Results and Discussion:

A total of 361 subjects aged 15 to 30 years were enrolled in the study (Table 1) between September 2009 and May 2011. Twenty-four (24) (6.6%) were positive for trichomonas by direct examination while 91(25.2%) were found to be positive using cultures inclusively. Of the 91 subjects who tested positive for *T. vaginalis*, 48(52.7%) were asymptomatic while 43(47.3%) had penile discharge and other symptoms like penile irritation and dysuria. According to their occupations, traders ranked highest at 30(32.96%) closely followed by bus drivers/bus conductors at 29(31.86%) (Table 2). Secondary school students had the least prevalence of 2.19%. Age-wise, the age group that had the highest prevalence (Table 3) is age group 27-30year-olds at 47.2%. The least was recorded as the youngest age-group of 15-18 year-olds at 11.3%.

Tables 4a and 4b show the breakdown of the result by age-groups. Table 4a shows that by direct microscopy using wet preparation of samples, only 24 (6.6%) yielded positive results out of the 361 males examined. Table 4b however shows that the culturing of the samples as shown in Table 4a (i.e. urine deposit and urethral samples) increased the yield to a total of 73(20.2%) of the 361 males sampled. There was a significant difference in the yields obtained from the two different samples both for culture and for wet preparation ($p>0.05$).

Of these 361 subjects, 44 also submitted their semen samples for analysis. A total of 18(40.9%) of these yielded positive results with 2(11.1%) being from wet preparation and 16 (88.9%) from semen culture. The sum total of *T. vaginalis* detected in the study was therefore 73+18=91(25.2%) out of the total of 361 subjects included in the study.

The incidence of positive cases of 25.2% observed in this study is surprising compared to the usual low or negative result reported in hospital laboratories in the area for males. This may be due to the fact that though infection rates between men and women are the same, women show symptoms while infections in men are often asymptomatic [6]. Transmission takes place directly because the trichomonads do not have cysts. Studies have also shown an estimated rate of asymptomatic cases as high as 50% or more [6]. According to Schwebke and Burgess [2], males rarely exhibit symptoms. This was seen in this study.

In males, *T. vaginalis* is infrequently diagnosed due to fewer symptoms and use of insensitive diagnostic tests [7]. In their investigation in North Carolina, USA, 540 women were examined of which 261 males identified as their most frequent sexual partners were also included. Of the 261 women with enrolled partners, 153 (58.6%) had symptoms and 70(26.8%) were asymptomatic. Based on the results of urine and urethral specimen by direct examination, 15.6% of the enrolled men were identified as having trichomoniasis. However, using cultures of the two specimens, 71.7% of them were found to have trichomonas infection. Among 53 males who also provided semen for analysis with PCR, the rate of infection was 81.1%. It therefore seems that culture rather than wet preparation tends to provide a more sensitive method for the diagnosis of trichomoniasis as shown in the current series.

In the hospitals in the same area, cultures for these organisms are reserved for research purposes and not routinely used. Also, it is a normal practice that people only visit hospitals when they have what they consider adequate signs and symptoms of a disease condition. This research included 95 asymptomatic and 266 symptomatic in the study. Surprisingly also 48 (52.7%) of the positive cases had no symptoms while 43 (47.3%) had symptoms suggestive of trichomoniasis. In the work of Sena et al[7], out of the 177 males who were positive for *T. vaginalis*, 136 were asymptomatic while only 21(11.9%) had penile discharge.

In the study carried out by Saxena and Jenkins [8], *T. vaginalis* was seen in 58% of asymptomatic males aged 16 to 22 years and there was no statistically significant difference in the age of the participants, frequency of intercourse and number of sexual partners in the preceding 3 months in men with positive and negative trichomonads test results (p=01). No single test was ideal for the diagnosis of trichomoniasis infection. However, urine sediment culture along with direct specimen test identifies 94% of all men positive for trichomoniasis [8].

Cultivation is a more sensitive diagnostic method than either immediate microscopy of a wet mount or of a centrifuged deposit [9]. This agrees with the finding in this study where culture methods yielded a much higher result than ordinary wet preparation of the same specimens - 20.2% and 6.6% -Tables 4a and 4b, respectively.

Occupation-wise, results show that the traders had the highest number of positive cases at 30 out of 91cases i.e. 33.7% while the bus drivers/bus conductors had the highest proportion of positive subjects at 53.7% (Table 2). These two groups of people more easily make some loose cash due to their life-style unlike the secondary school boys whose positive cases are of the proportion 3.4% as they are unable to afford transactional sex even if they want to.

Table 1 CANDIDATE INCLUDED IN THE STUDY

Age Group (yr)	OCCUPATION											
	Traders		Artisans		Bus drivers/Conductors		2 ^o students		Undergrads		Total	
Sum	EN	ON	EN	ON	EN	ON	EN	ON	EN	ON	EN	ON
15-18	10	14	2	5	6	6	10	20	2	5	30	50
80												
19-22	18	18	18	22	8	11	16	12	10	15	70	78
148												
23-26	8	13	13	17	5	11	0	0	17	13	43	54
97												
27-30	2	6	6	8	4	3	0	0	2	5	14	22
36												
Total	38	51	39	52	23	31	26	32	31	38	157	204
361												

KEY – EN is Enugu, ON is Onitsha, Undergrads is Undergraduates, 2^o is secondary

Table 2 Distribution of positive cases according to occupation

Occupation	No sampled	No positive	Proportion	% of total positive
Trading	89	30	33.7	32.96
Artisans	91	25	27.5	27.47
Bus Drivers/Bus Conductors	54	29	53.7	31.86
Secondary school students	58	2	3.4	2.19
Undergraduates	69	5	7.2	5.49
Total	361	91	25.2	100

Table 3 Age Distribution of Candidates infected with *Trichomonas vaginalis* in Enugu and Anambra States of Nigeria

Age group (yr)	No. sampled	No. Positive	Percentage
14-18	80	9	11.3
19-22	148	44	29.7
23-26	97	21	21.6
27-30	36	17	47.2

Table 4a Distribution of positive cases according to age group in years and specimen by Direct Examination/Microscopy

Age group (yr)	No. sampled	Urine deposit	Urethral sample	Total
15-18	80	3	2	5
19-22	148	4	7	11
23-26	97	3	2	5
27-30	36	1	2	3
Total	361	14	10	24(6.6%)

Table 4b Distribution of positive cases according to age-group (yr) and specimen

Age-group (yr)	No cultured	Cultured specimens		Total culture
		Urine deposit culture	Urethral sample	
15-18	80	4	3	7
19-22	148	16	20	36
23-26	97	7	10	17
27-30	36	5	8	13
Total	361	32	41	73 (20.2%)

Table 5 Distribution of *Trichomonas vaginalis* from semen analysis

Age-group (yr)	No examined	No positive		Total
		wet preparation	semen culture	
15-18	6	0	2	2
19-22	15	1	7	8
23-26	13	1	3	4
27-30	10	0	4	4
Total	44	2	16	18 (40.9%)

III. Conclusion:

The authors conclude that a good number of the young males in this area are infected with *T. vaginalis* even though the prevalence of symptoms is low. It is suggested that the organism should be sought for and so more sensitive methods like culture method and PCR analysis should be specifically asked for. Pediatricians who care for sexually active adolescents should strongly consider this infection even when there is no symptom. Contacts of positive female cases should be traced more confidently. The ease of successful treatment of this infection will encourage the prevention and treatment of the negative Reproductive health and other health consequences that could result.

Subjects and Methods: Two popular laboratories with high clientele each in Enugu and Onitsha in Enugu and Anambra States of Nigeria were arranged with to be involved with the study after obtaining Ethical Clearance from the Ethical and Research Committee of The University of Nigeria Teaching Hospital, Enugu. Semen samples were collected in these laboratories. This is because patients go there by choice anyway, besides, it is known that some clients walk in and request for one investigation or the other especially this when they feel

they have treaded wrongly and would not want to confront the doctor and pay consultation fee in addition. Private and Government hospitals and clinics in the vicinity/neighborhood were requested to send appropriate patients to these private laboratories – both those that have symptoms and those that do not have – including those that came for ‘check-ups’. Clients had the option of participating in the study or not. A consent form was offered to each of them or read to them. Prostatic massage was done on asymptomatic individuals using sterile cotton wool. ‘Early morning urine’ samples were also found useful and studied.

DIRECT EXAMINATION:

The urine samples were centrifuged and sediments examined under the microscope (x10 and x40 objectives) for the typical form and motility of the trichomonads. Urethral specimens and semen samples were similarly treated using saline preparations (wet preparations). All negative specimens were then cultured.

CULTURE: Urine sample cultures, urine sediment cultures and semen cultures were set up and the swabs promptly placed into a tube of Oxoid *Trichomonas* medium for transport to the laboratory. The medium was supplemented with antibiotics – penicillin and streptomycin.

The complete medium consists of the following:⁶

Liver Digest (Oxoid), 4% solution.....	300ml
Glucose, 5% solution.....	100ml
Salts solution (NaCl, 1lt, KCl, 400ml, MgCl ₂ , 30ml, CaCl ₂ , 10ml).....	392.5ml
Buffer solution-Na ₂ HPO ₄ , pH 7.4.....	86.4ml
NaH ₂ PO ₄	13.6ml
Benzyl Penicillin solution (Glaxo).....	5ml
Streptomycin sulphate solution	2.5ml
Branocresol purple.....	15mg

Cultures were incubated at 37°C for 4 days. A colour change to yellow indicated a culture that contained *T. vaginalis*. Identification of the characteristic morphology of *T. vaginalis* was confirmatory.

Competing Interests: The authors declare no conflicting interest.

Abbreviations: CaCl₂-Calcium chloride, HIV – Human Immunosuppressive Virus,

MgCl₂- Magnesium chloride, NaCl – Sodium chloride, Na₂HPO₄ – Sodium phosphate, PCR – Polymerase Chain Reaction, PID – Pelvic Inflammatory Infection, KCl – Potassium Chloride, STI – Sexually Transmitted Infection, *T. vaginalis* – *Trichomonas vaginalis*,

Author’s contributions; NFO and ARCN formulated the study after NFO identified *T. vaginalis* in a male in the laboratory. NFO and ARCN read around *T. vaginalis*. NFO wrote up the methodology and ARCN then typed the manuscript. ARCN was made the corresponding author after NFO read what was written.

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