PREVALENCE OF CHLAMYDIA TRACHOMATIS AMONG INFERTILE WOMEN AT ENUGU STATE UNIVERSITY TEACHING HOSPITAL, PARKLANE, ENUGU.

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ABSTRACT

Chlamydia trachomatis infection is among the most common sexually transmitted diseases. It may be primary or secondary .The study aimed to determine the prevalence of chlamydia trachomatis bacteria isolated from high vaginal swabs collected from gynaecology clinic department among infertile women attending Enugu State University Teaching Hospital, Parklane. This is a cross sectional study conducted around 15th of July to 20th of November. The study population was about a total number of 150 samples which was collected among infertile women attending the gynaecology clinic with a structured questionnaire being used to collect the data in line with the ethical standards. A rapid test kit device was used for confirmation of the bacteria; chlamydia trachomatis, in which procedure for the detection of chlamydia trachomatis was carried out. After extraction from swabs,3 drops of the extracted solution was poured into the well of the cassette which the result is read after 10 minutes .Data was analyzed statically using software SPSS version 27. The Result revealed a low prevalence of 3 cases(2.0%) which tested positive for the infection. Age was the only statistically significant factor associated with infection (p = 0.022), with women aged 25–39 years showing increased susceptibility. This finding aligns with studies indicating higher susceptibility among younger women due to biological factors such as cervical ectopy, polycystic ovarian syndrome. In contrast, no significant associations were found between marital status, educational level, contraceptive use, type of infertility, or duration of infertility (p > 0.05). In conclusion, these results contrast with previous studies that found higher infection rates among married women and those with a history of sexually transmitted infections. The low prevalence observed may be attributed to improved awareness and preventive health measures, including health education on sexual health and routine screening.

Keywords: Chlamydia trachomatis, Infertility, Risk factors, Age, Screening, Enugu, Nigeria.

INTRODUCTION

Infertility refers to the inability of a couple to achieve conception after one year of regular, unprotected sexual intercourse. For women 35years and older a period of 6 months is sufficient to ascribe the diagnosis. (Zegers-Hochschild F et.al,2009). In many gynaecological clinics in developing countries, infertility constitutes a major presenting compliant and accounts for greater than 20% of consultations (Adegbola O et.al,2013). A high premium is placed on a woman's ability to reproduce; therefore, infertility can be a source ofsocio-cultural, psychological, and financial disharmony in affected couples (Dyer SJ et.al,2002). Primary infertility is a term used to designate those couples who have never conceived, whereas secondary infertility is a term used for a condition where a prior pregnancy, although not necessarily a live birth has occurred (Mira A et .al,2012). Prevalence varies across different regions of the world and is estimated to affect 8% to 12% of couples worldwide (Paul AC et.al,2011).

Chlamydia trachomatis (C. trachomatis) infection is among the most common sexually transmitted diseases (ElizabethTorroneJP et.al,2012). Chlamydia trachomatis (CT) infections represents, globally, the most prevalent sexually transmitted infection (STI) caused by bacteria, with 131 million new cases per year.(Phillips J A et.al,2019). Chlamydia trachomatis, which is an obligate intracellular parasite, can have a specific infectious potential to epithelial cells from male and female reproductive tracts. In symptomatic cases, men can present with urethritis, or, less commonly, epididymitis, and women, besides yellowish vaginal discharge, spontaneous bleeding, pain during sex or urination, and pelvic pain, may be led to pelvic inflammatory disease (PID).(Safarkar R et.al,2018).Therefore, the majority of infected individuals do not seek treatment, not only risking their sexual partners' health, but also worsening their condition, as the persistent presence of the pathogen evocates a chronic immune response, leading to an enhanced production of genital immune mediators, like interleukin (IL)-, IL-6 and gamma interferon, which increases the number of epithelial cells destroyed. (Ziklo N et.al,2016). This process is very dangerous, especially among women, once the manifestations and consequences are more damaging to their reproductive health than man's, a fact elucidated by the evidence that approximately 20% of women with chlamydial lower genital tract infection will develop PID, 4% develop chronic pelvic pain, 2% adverse pregnancy outcomes (chromosomal abnormalities, miscarriages, congenital malformations and stillbirth) and 3% infertility—probably due to scar formation and occlusion of the Fallopian tubes. (Paavonen J et.al,1999).

The prevalence of Chlamydia trachomatis infection among infertile women, attending the gynaecological clinic in Nigeria(southern); recorded about 0.7% , one positive sample present for chlamydia trachomatis out of 140 patients which was screened (Adesiji Y O et .al 2015). Which also in University College Hospital, Ibadan recorded 49.8%. This finding was similar to that reported by Mawak (Makwak JD et.al,2011) in a study conducted among women attending a gynaecological clinic in North-Central Nigeria. Untreated cases of chlamydia can cause damage to the reproductive system considering the high rate of asymptomatic chlamydia infections particularly in women; silent ,undetected or lack of information could put the population at significant risk for infertility. The gap in knowledge requires early detection of the infection, addressing its risk factors and treatment to prevent complications leading to infertility by promoting health awareness programs and screenings.

Due to the often asymptomatic nature of the infection (chlamydia trachomatis) ,on regular screening for chlamydia is crucial, especially in high-risk populations. The Centers for Disease Control and Prevention (CDC) recommend annual screening for sexually active women under 25 years and older women with risk factors (CDC, 2020). Diagnostic methods include nucleic acid

amplification tests (NAATs)(Sadiq et al., 2019), point of care (PCR) tests which are ASSURED Criteria(Affordable ,sensitive ,specific ,user-friendly ,Rapid and Robust, Equipment-free, delivered to end-users) (Sherry S et.al,2021).

Early detection and treatment are very vital for preserving reproductive health.Infertility associated with Chlamydia trachomatis infection remains a pressing public health concern, particularly in Nigeria. Enhanced awareness, screening, and treatment strategies are essential to mitigate the impact of this infection on reproductive health This Study was aimed to determine the prevalence of chlamydia trachomatis among infertile women attending Enugu state university teaching hospital and to explore its risk factors associated with infertility

MATERIALS AND METHOD

Study Area: This study was carried out at Enugu State University of Science and Technology Teaching Hospital , Parklane. A tertiary health institution serving both high, middle and lower socioeconomic status.

Study design: This was a cross sectional study of Chlamydia trachomatis bacteria which was isolated from high vaginal samples among infertile women.

Study population : The study population was recruited from high vaginal samples of women that visited gynaecology clinic during their clinic visit at ESUTH Parklane, aged 25 to 45 years.

Sampling technique: inclusion criteria were met,which are the following :Women diagnosed with infertility casesthat attended ESUT Teaching Hospital,those who were willing to participate and women aged within the range of 25- 45 years. The exclusion criteria met were; Women who were menstruating and women who were taking fertility medications. Thereafter, a well structured questionnaire was used to obtain relevant informations.

Data Analysis: Statistical analysis was performed with the help of SPSS statistical software package version 27 and the Chi-square test. All tests were considered statistically significant when (p> 0.05) was considered statistically significant.

Sample collection and analysis: collected samples were analyzed using a Chlamydia Rapid Test Kit Device- swab. A sterile plastic shaft Dacron swab was used in collecting specimens from infertile women. The swab was processed to extract Chlamydia antigen and analyses using the chlamydia test kit. The chlamydia rapid test kit device is a qualitative lateral flow immunoassay for the detection of chlamydia antigen from female cervicak swab, make urethral swab and male urine specimens manufactured by int r-chemical LTD.China. In this test antibody specific to the chlamydia antigen showed a coloured line in the test line region. The presence of this coloured line in the test line region indicates a positive result, while it's absence indicates a negative result. The test procedure was conducted according to the manufacturer's instruction manual.

Ethical Consideration: The study was approved by the Ethics Committee Of Enugu State University Teaching Hospital,Parklane (ESUTH/HREC/2024/10/21).

RESULTS

Table 4.1: Prevalence of *Chlamydia trachomatis* among infertile women

Variables	Prevalence	
	N	%
Infertile women examined	150	100.0
Presence of *Chlamydia trachomatis*	3	2.0

Table 4.1 presents the prevalence of *Chlamydia trachomatis* infections among infertile women at ESUTH Parklane. Out of the 150 infertile women examined, 3 (2.0%) tested positive for *Chlamydia trachomatis*.

Risk Factors	Positive (n = 3)	Negative (n = 147)	p-value
Age			
25-29	1	10	0.022
30-34	1	69	0.452
35-39	1	44	0.613
40 & above	0	24	0.558
Marital Status			
Single	1	10	0.780
Married	2	131	0.109
Divorced	0	6	0.960
Educational Level	0	10	0.890
Primary	2	68	0.672
Secondary	1	69	0.450
Tertiary			
Duration of Infertility			
1-2 years	0	34	0.540
3-4 years	2	87	0.142
5 years & above	1	26	0.564
Type of Infertility			
Primary	1	46	0.990
Secondary	2	101	0.120
Number of Sexual Contacts			
1	2	82	0.243
≥1	1	65	0.743
Use of Contraceptive		36	
Yes	1	111	0.642
No	2		0.433
Age at First Intercourse			
≤ 20	2	76	0.344
≥ 20	1	71	0.670
Previous History of STI			
Yes	1	39	0.554
No	2	108	0.622

Table 4.2 Risk factors associated with *chlamydia trachomatis* infections among infertile women at ESUTH Parklane

Table 4.2 presents an analysis of the risk factors associated with *Chlamydia trachomatis* infections among infertile women at ESUTH Parklane using Fisher's Exact Test. Among the assessed factors, only age group 25-39 years shows a statistically significant association with *Chlamydia trachomatis* infection ($p = 0.022$), suggesting increased vulnerability within this age group.

Other variables, including marital status, educational level, duration of infertility, type of infertility, number of sexual contacts, contraceptive use, age at first intercourse, and previous history of sexually transmitted infections (STIs), do not show significant associations with infection ($p > 0.05$). For instance, marital status (single vs. married, $p = 0.780$) and previous history of STIs ($p = 0.554$) do not appear to influence the likelihood of *Chlamydia trachomatis* infections in this study population.

These findings highlight that age may play a role in *Chlamydia trachomatis* susceptibility among the infertile women studied, while other demographic, gynecological, and sexual history factors may have limited or no direct association with the infection in this context.

Table 4.2: Sociodemographic, Gynecological and Sexual History of the Respondents (n=150)

Variables	Frequency	Percentage (%)
Age		
25-29	11	7.3
30-34	70	46.7
35-39	45	30.0
40 & above	24	16.0
Marital Status		
Single	11	7.3
Married	133	88.7
Divorced	6	4.0
Educational Level		
Primary	10	6.7
Secondary	70	46.7
Tertiary	70	46.7
Duration of Infertility		
1-2 years	34	22.7
3-4 years	89	59.3
5 years & above	27	18.0
Type of Infertility		
Primary	47	31.3
Secondary	103	68.7
Number of sexual contact of Partners		
1	84	56.0
≥ 1	66	44.0
Use of Contraceptive		
Yes	37	24.7
No	113	75.3
Age at First Intercourse		
≤ 20	78	52.0
≥ 20	72	48.0
Previous history of STI		
Yes	40	26.7
No	110	73.3
Gynecological Condition		
Anovulation	8	5.3
Vaginal Discharge	9	6.0
Ectopic Pregnancy	9	6.0
Hormonal Imbalance	11	7.3
Irregular Periods	13	8.7
Miscarriage	8	5.3
Normal	49	32.7
Polycystic Ovarian syndrome	12	8.0
Pelvic Pain	5	3.3
Uterine Fibroid	26	17.3

Table 4.2 shows the sociodemographic, gynecological, and sexual history of the respondents in the study. Among the respondents, 11 (7.3%) were aged 25–29 years, 70 (46.7%) were aged 30–34 years, 45 (30.0%) were aged 35–39 years, and 24 (16.0%) were aged 40 and above. Regarding marital status, 11 (7.3%) were single, 133 (88.7%) were married, and 6 (4.0%) were divorced.

In terms of educational level, 10 (6.7%) had primary education, 70 (46.7%) had secondary education, and 70 (46.7%) had tertiary education. For the duration of infertility, 34 (22.7%) had been infertile for 1–2 years, 89 (59.3%) for 3–4 years, and 27 (18.0%) for 5 years and above.

The type of infertility was categorized as primary for 47 (31.3%) and secondary for 103 (68.7%) of the respondents. Regarding the number of sexual contacts, 84 (56.0%) reported having one sexual partner, while 66 (44.0%) had more than one sexual partner.

As for contraceptive use, 37 (24.7%) used contraception, while 113 (75.3%) did not. In terms of age at first intercourse, 78 (52.0%) had their first sexual intercourse at or before the age of 20, and 72 (48.0%) had it after the age of 20.

Regarding previous history of STI, 40 (26.7%) had a history of sexually transmitted infections, and 110 (73.3%) did not.

The most common gynecological conditions were Uterine Fibroid (26, 17.3%), Irregular Periods (13, 8.7%), and polycystic ovarian syndrome (12, 8.0%). Other conditions included Hormonal Imbalance (11, 7.3%), Ectopic Pregnancy (9, 6.0%), Vaginal Discharge (9, 6.0%), Anovulation (8, 5.3%), and Miscarriage (8, 5.3%). Finally, 49 (32.7%) of the respondents had normal gynecological conditions, while 5 (3.3%) reported pelvic pain.

DISCUSSION

This study aimed to evaluate the prevalence and risk factors associated with *Chlamydia trachomatis* infections among infertile women at ESUTH Parklane. Out of 150 participants, the prevalence of *Chlamydia trachomatis* was found to be 2.0%, with only 3 cases testing positive. This low prevalence differs from findings in a similar study conducted by Nwankwo and Magaji (2014) in Kano, North-Western Nigeria, who reported a prevalence rate of 9.6%.

The variability in Chlamydia trachomatis prevalence may be attributed to differences in geographical location, healthcare access, and population demographics between the two studies. Additionally, the low prevalence observed in this study could be linked to increased awareness and preventive measures, such as improved sexual health education and wider availability of diagnostic services. Furthermore, cultural and behavioral factors, including reduced high-risk sexual behaviors within the study population, may have contributed to the lower rates.

The analysis of risk factors (Table 4.2) revealed that age was the only statistically significant factor associated with *Chlamydia trachomatis* infection (p = 0.022). Women aged 25–39 years showed higher susceptibility, consistent with studies suggesting that younger women are at greater risk due to biological factors such as cervical ectopy, which facilitates bacterial adherence (Quinn et al., 2016). This finding underscores the importance of targeted interventions for younger women, including routine screening and health education. Marital status did not show statistically significant associations (p > 0.05). This finding contradicts those of Nwankwo and Magaji (2014), whose study reported that married patients were associated with a higher infection rate than single patients (8.3%).A previous history of sexually transmitted infections (STIs) did not show statistically significant associations (p > 0.05). Nwankwo and Magaji (2014), whose study reported these findings, contradict those of this study, where previous STD exposure was associated with an increased risk of *Chlamydia* infection. This disparity could be attributed to differences in study design, population demographics, or healthcare access between the two settings.

A study conducted by Ogbu (2017) reported that earlier sexual debut and a higher number of sexual partners were significant risk factors for *Chlamydia trachomatis* infection among infertile women in Benin City. This finding contrasts with the results of the current study, where the number of sexual contacts and age at first intercourse did not show statisticallysignificant associations with *Chlamydia trachomatis* infection (p > 0.05). This disparity could be attributed to differences in population demographics of both studies. For instance, the women in the study by Ogbu (2017) may have had different social and sexual networks compared to those in this study.

Other variables, such as marital status, educational level, duration of infertility, type of infertility, and contraceptive use, did not show statistically significant associations (p > 0.05). These findings suggest that while these factors may influence *Chlamydia trachomatis* infections in certain populations, they do not appear to have a direct, measurable impact on infection risk among infertile women in this study. This lack of significant association could reflect regional variations in sexual health education, healthcare access, and personal behaviors, which might mitigate the influence of these factors in this population. It is crucial for future studies to consider the role of such variables in different socio-cultural contexts, as they may still present underlying risk factors when examined alongside other determinants of reproductive health.

CONCLUSION

This study found a low prevalence of *Chlamydia trachomatis* (2.0%) among infertile women at ESUTH Parklane. This could be due to improved sexual health education and access to diagnostic services. Age was the only statistically significant risk factor, with women aged 25–39 years showing higher susceptibility, likely due to biological factors like cervical ectopy, Polycystic Ovarian

Syndrome. In contrast, other factors such as marital status, education, and contraceptive use did not show significant associations. These findings highlight the importance of age-targeted interventions and emphasize the need for continued sexual health education and screening to reduce *Chlamydia* infections among infertile women.

Based on the findings of this study, the following recommendations are proposed:Health facilities should implement routine screening for *Chlamydia trachomatis* among women of reproductive age, especially those in the 25–39 age group, to promote early detection and reduce infertility risks. Public health campaigns should target younger women, raising awareness about *Chlamydia* risks and safe sexual practices, integrated into existing sexual health education programs.

Further research should investigate the socio-cultural factors influencing *Chlamydia* infection rates to better inform prevention strategies tailored to specific populations.

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