

# Prevalence and Risk Factors Associated with *Trichomonas vaginalis* Among Adults in Tafawa Balewa Local Government Area, Bauchi State. Nigeria

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## **Abstract- Introduction:**

*Trichomoniasis is nowadays the most prevalent non-viral sexually transmitted infection in the world. In Bogoro L.G.A, Bauchi State, the epidemiology of Trichomoniasis is not well known. The current study aimed at Prevalence and risk Factors associate with T. vaginalis Among Adults the prevalence and factors associated with T. vaginalis infection among women with vaginal discharge.*

## **Methods:**

*A longitudinal study design was employed to investigate women attending the General Hospital Alkaleri between Jun-Nov 2021. Cochran's formula (Cochran, 1963) was used to calculate the sample size 209 A multistage sampling was use to select respondent from the target population. A structured questionnaires was admitted to obtain demographic characteristics (such as age, marital status, level of education, occupation, parity and gestational age), for each participant. A retrospective analysis of laboratory records from patients referred at the General Hospital in Alkaleri, Bauchi State. For vaginal discharge was carried out. The study covered the period from June to Nov 2021. For each participating woman, a vaginal swab was collected and a wet mount smear performed immediately. Optic microscopic examination with 40x magnification was done to detect T. vaginalis and to check their biological modifications such as presence of epithelial cells, white blood cells, and red blood cells. A gram-stained smear was also performed and examined under oil immersion (100x magnification) to check for vaginal flora.*

## **Results:**

*The study had 200 women who were enrolled with a mean age at 35.2 ± 10years. The prevalence of Trichomoniasis represented 4.8%, 95% CI(3.1-5.7)*

*and it was lower among women less than 30 years (4.1%), while divorced women more likely to be infected compared to married and single women (aOR:2.1, 95%CI (1.2-3.7). Trichomoniasis was associated with abnormal vaginal flora such as type III (aOR:2.6, 95% CI(1.5-4.4)) and type IV (aOR:3.3, 95%CI(2.1-5.3). In addition, patients with erythrocytes excretion were more likely to be infected by T. vaginalis (a OR: 2.8, 95% CI(1.9-3.9).*

## **Conclusion:**

*Trichomonas vaginalis remains prevalent among sexually active women. Strategies aiming at improving disease awareness in these high-risk groups are needed to improve Trichomoniasis prevention but extensive epidemiological data are still needed for a better understanding of the disease transmission dynamic*

## I. INTRODUCTION

Trichomoniasis is a sexually transmitted disease (STD), pathogen that will not go away because we ignore it [3]. Besides, research has shown T. vaginalis infection increases the risk of HIV transmission in both men and women.[6]. It is estimated that, in women alone, 747 new HIV cases per year result from the facilitative effects of T. vaginalis on the transmission of HIV.[4]. Overall persons with trichomoniasis are twice as likely to develop HIV infection as the general population. [9]. Hence, due to the organism's unique energy metabolisms the organism bears a strong resemblance to anaerobic bacteria (Petrin, 2018). In wet mouth preparation of vaginal secretions, the live organism can often be recognized by its unmistakably swaying motion [13]. T. Vaginalis grows best under anaerobic conditions

and at elevated PH levels. Maximum growth and metabolic functions are greatest at PH of 6.0 [17].

According to [14], Trichomoniasis often times is asymptomatic in both men and women to the ratio of 50-70% which constitutes major source of transmissions of the infection. In women, trichomonas has also been found to increase the risk of cervical cancer.[19]. More so, in pregnant women, T. Vaginalis infection has been associated with an increased risk of low birth weight, preterm delivery, and intrauterine infection. [5]. Consequently, symptoms like vaginal discharge was found in 42% of women with trichomoniasis [7]. This discharge is classically described as thin and frothy; however, this is only seen in about 12% of patients [7]. This discharge is often yellow and is sometimes viscous enough to be confused with candidiasis.

Furthermore, in symptomatic men, T. vaginalis infection usually manifests as urethritis. As many as 11% of nongonococcal urethritis cases in men are caused by T. vaginalis. [8]. Complications of untreated trichomoniasis in men include prostatitis, epididymitis, urethral stricture disease, and infertility, potentially resulting from decreased sperm motility and viability [12]. Thus, Considering the potential impact of Trichomonas vaginalis on the reproductive health of both men and women this study investigated the risk factors responsible for the prevalence of Trichomonas vaginalis infections among adults in Tafawa Balewa Local Government Area, Bauchi State.

## II. MATERIALS AND METHODS

**Population of the Study:** The population of the study comprise of two Hundred (200), Female adults who were attending health facilities in the study area. The inclusion to participate is purely on voluntary basis.

### Study Area

Alkaleri local government area is located on latitude 10°15'N and longitude 10°20'E. The LGA has an area of 5,918 square kilometer and population of 329,424 people according to 2006 population census (NPC, 2006). Its headquarters are in the town of Alkaleri (or Alkalere) on the A345 highway in the northern part of the Local Government Area. The Local Government is

bounded in the North by Gombe State; East by Kirfi Local Government Area; South Tafawa Balewa and West Bauchi Local Government Areas. The predominant ethnic group in the area are the Fulani with some Kanuri, Dugurawa, Guruntawa and Labur "Jaku" people present and majority of the indigenes are traders and farmers.

### Sample Size Determination

The Cochran's formula (Cochran, 1963) was used to calculate the sample size.

The minimum sample size (N) was obtain from the analytical formula

$$N = \frac{z^2 p(p-1)}{d^2}$$

$$n = \frac{5215}{0.0025}$$

$$n = 209$$

### Method of data collection

The structured questionnaire was administered in a probability sample of Adults. Vaginal swabs specimen, was obtain from consenting patients and the sample process following standards protocols.

### Method of data analysis

The data analysis was carried out using SPSS statistical package 22.0 for windows (IBM corps, amour, New York, United State), and descriptive statistics was computed for all relevant data..

### Reliability of the Instrument

The Cochran's alpha technique was used for testing the reliability for the instrument.

### Results

The research work was conducted on Prevalence and risk factors associated with Tricgomonas vaginalis among adults in Tafawa Belewa Local Government Area, Bauchi State. A total number of two hundred questionnaires were administered and return for analysis.

### Demographic Characteristics of Participants

The demographic characteristics of the 200 women with vaginal discharge showed that the mean age of the study participants was 35.2 and the majority were below the age of 40years indeed, 19% of the women

were less than 40 years and 35.2% of them had an age range from 30-35 years, married women represented a proportion of 36%, while single and divorced women represented respectively 25.5% and 15%.

Table1: Demographic Characteristics of the Respondents

Parameters	Number	Frequency	95% ci
Study period			
June	43	21.5	20.2-22.8
July	10	30	4.4-5.6
August	21	10.5	9.4-11.6
September	52	29	24.7-27.3
October	62	35	29.6-32.4
Nov	12	6	5
Total number of participants	200		

Mean Age: 35.2 ± 10Years.

Microscopic Findings among the Study Participants. Optic microscopic examination of wet mount smear revealed the presence of white blood cells among 200 participants (100%). Presence of white blood cell within the vaginal discharge was categorized as rare for 67 participants (32.5%), moderate for 31 participants (15.5%), many for 29 participants (14.5%), and high for 26 participants (12.8%). Out of the 200 examined vaginal swabs, 34 (17%), were found with red blood cells. The importance of these red blood cells was considered as rare for 66 specimens (33%), moderate for 46 specimens (23%), many for 28 specimens (14%), and high for 26 specimens (13%). Giemsa stained smear microscopic examination revealed that 75 women had a type I vaginal flora (37.5%), while 56(28%) had a type II vaginal flora. Abnormal vaginal flora type III and type IV represented, respectively, a proportion of 15% and 19.5%.

Table 2: Microscopic Findings among the Study Participants.

Leukocytes (WBC)	Number	Frequency	95% ci
Absence	48	24	23.5 – 24.5
Rare	67	32.5	31.1-33.9
Moderate	31	15.5	14.1-16.9
Many	29	14.5	13.8-15.2
High	25	12.5	11.8-13.2
Red Blood cell (Erythrocytes)			
Absence	34	17	15.8-18.2
Rare	66	33	32.4-33.6
Moderate	46	23	22.1-23.8
Many	28	14	13.6-14.
High	26	13	12.8-13.2
Vaginal flora			
Type I	75	37.5	36-39
Type II	56	28	26.8-29.2
Type III	30	15	13.9-16.1
Type IV	39	19.5	18-21

Assessed by Nugent Score.

Prevalence and distribution of *Trichomonas vaginalis* infection among the study participants

Among the 200 patients referred at the General Hospital for vaginal discharge, 127 of them were infected by *Trichomonas vaginalis* providing a prevalence of 63.5%, 95% CI (56.6- 59.2). Analysis of *T. vaginalis* distribution by age group revealed increasing prevalence as age group increases. Among women less than 25 years old, a prevalence of 57.9% was noted, while it was at 53.8% among women with an age between 25 to 30 years old. *T. vaginalis* prevalence was at 67.7%, 75%, 75%, and 72.7%,

respectively, among women with an age range between 31 to 35 years, 36 to 40 years, 41 to 45 years, and more than 45 years. The highest prevalence was noted among divorced women (13.3%) followed by non-married women (single) (9.8%) and married women (9.7%). In June, a prevalence of 48.8% was noted versus 42.9% in August. Among the 52 examined participants in September, 20 of them were found with *T. vaginalis* providing a prevalence of 38.5%.

Table 3: Prevalence and distribution of *Trichomonas vaginalis* infection among the study participants

Parameters	Number of examined women	Number of positive	Prevalence (%) (95%CI)
Overall	200	127	63.5 (62.9 – 64.1)
Age group	38	22	57.9 (56.6 - 59.2)
Less than 25 years			
25 to 30 years	65	35	53.8 (52.7 - 54.9)
31 to 35 years	31	21	67.7 (66.1 – 69.3)
36 to 40 years	24	18	75 (72.9 - 77.1)
41 to 45 years	20	15	75 (72.6 - 77.4)
46 and more	22	16	72.7 (71 – 74.4)
Marital status			
Single	51	5	9.8(8.5-11.1)
Divorced	30	4	13.3(9.7-16.9)
Married-monogamous	72	7	9.7(9-10.4)
Married-polygamous	47	3	6.4(4.8-8)
Study period			
June	43	21	48.8(47.2-50.4)
July	10	5	50 (5.5-54.5)
August	21	9	42.9(40.7-45.1)

September	52	20	38.5 (37.3-39.7)
October	62	29	46.8 (45.8-47.8)
Nov	12	6	50 (48.5-51.5)

### III. DISCUSSION

The prevalence of *T. vaginalis* infection in this study was lower than what was reported in other African countries such as Zimbabwe where a prevalence of 9.5% was found, [16]. But it is consistent with the reported prevalence of 5% in the Pakistan region, [11]. In contrast, higher prevalence was reported in the USA among imprisoned women, [1]. These variations can be due to variability in terms of disease exposure, As well as use of different diagnostic methods across studies. Unlike other studies that showed higher prevalence among married women, [2]. This study revealed that divorced women were more likely to develop *Trichomoniasis* compared to single and married women. However, without additional information on participant’s sexual behavior, educational level, or knowledge about STI, it was not possible to clearly explain the relationship between marital status and *Trichomoniasis* prevalence. Epidemiological studies have established that low educational level, smoking, and sexual behaviors are significantly associated with *Trichomonas vaginalis* infection. But our study did not collect information on these variables.

The data showed significant biological modifications associated with *Trichomonas vaginalis* infection. Indeed, patients with red blood cell within the vaginal swabs were more likely to be infected compared to patients for whom no red blood cell was found in the vaginal swab. Infection with *T. vaginalis* can result in significant inflammatory and *cytolytic* actions induced by the parasites itself and the severity of these pathogenic actions depends on the host and *T. vaginalis* strains, [18]. Moreover, *T. vaginalis* infection was associated with significant modification of the vaginal flora and participants with abnormal vaginal flora (Types III and IV) were more likely to be infected. These findings are consistent with data from longitudinal studies that have shown increasing risk of

acquiring *T. vaginalis* among patients with bacterial vaginosis, [15]. As it was the case in our study.

The study has some limitations. In the current study, *Trichomonas vaginalis* detection was only based on wet mount smear microscopic examination as part of a routine standard practice and no additional investigations such as culture or PCR were done. This may have lowered parasite detection rate. It is well established that, among the available methods, at least two methods are better for diagnosis of *T. vaginalis*, for example, culture and wet mount microscopy, [10].

#### CONCLUSION

*Trichomonas vaginalis* remains prevalent among women with vaginal discharge with a higher burden among sexually active women. Strategies aiming at improving disease awareness among these high-risk groups are needed and should include health promotion, education, and prevention with regard to sexual behaviour.

#### ACKNOWLEDGEMENT

My sincere appreciation goes to my supervisors, Prof. Rev. Sr. E.T. Oparaocha who offered pains and time guiding me from the beginning to the end of this work. Also I'm very grateful with the entire management and staff of Public Health department for the opportunity given to me to engage in the rewarding exercise of writing this project work, especially the HOD, Prof. (Mrs.) E.A. Nwoke, for her advice and mentorship.

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