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RESEARCH ARTICLE

EXAMINING THE INCIDENCE OF *CANDIDA ALBICANS* AND *TRICHOMONAS VAGINALIS* AMONG PREGNANT WOMEN IN RURAL COMMUNITIES OF KOGI STATE

Simon Abuh and Salifu Melinga
Department of Biology, Kogi State College of Education, Ankpa.

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Abstract

Candida albicans and *Trichomonas vaginalis* are *Candida albicans* and *Trichomonas vaginalis* are fungal infections that are raising health concerns. The study's objective was to examine the incidence of *C. albicans* and *T. vaginalis* infections among pregnant women in the rural communities of Kogi state. A total of three hundred and thirty-six women who attends antenatal care in public health institutions participated in the study. The study samples were pooled from the participants through their consulting physicians. The Analysis conducted on the samples showed that 61.3% of the total samples tested positive for *C. albicans*, 5.1% tested positive for *T. vaginalis*, and 33.6% were negative for both infections. However, no co-occurrence was reported. The study concludes that the disease is prevalent in Kogi state and recommends a robust enlightenment approach.

Introduction: -

Fungal infections are a public health issue that is currently becoming prevalent in our society and contribute to morbidity and mortality in healthy and immunocompromised individuals, respectively (Richardson & Moyes, 2015; Tong & Tang, 2017). It affects immunocompromised and uncompromised because they can increase under nutrient-rich and nutrient-poor conditions (van Ende et al., 2019). The polymorphic fungus *Candida albicans* is a member of the average human microbiome (Mayer et al., 2013) and the most common opportunistic fungal infections (Bakhtiari et al., 2019; Kornitzer, 2019).*Candida albicans* have evolved to persist in the numerous challenging niches of the human body(Nikou et al., 2019). Over the years, evidence has implicated *Candida albicans* as one of the primary causal agents of health-threatening invasive infections with increased mortality (Chen et al., 2020). *Candida albicans* is a commensal resident of the human gastrointestinal and genital tracts (Desai, 2018) and the most common cause of nosocomial fungal urinary tract infections (Behzadi et al., 2015). Also, *Candida albicans* have the potential of invading the gut epithelium barrier via microfold cells and enter the bloodstream (Tong & Tang, 2017).

Vaginal candidiasis is frequent in pregnant women and is associated with sepsis and adverse neonatal outcomes (Ghaddar et al., 2020). Pregnant women are more susceptible to vaginal candidiasis, which may lead to pregnancy complications like abortions, premature birth, low birth weight, and other morbidities (Ocan et al., 2018; Rai et al., 2017).

Trichomonas vaginitis is the most common nonviral sexually transmitted infection with symptoms ranging from foamy vaginal discharge, dysuria, and spotting (Meites et al., 2015; Segal et al., 2018). Trichomonas vaginitis is a

Corresponding Author: - Simon Abuh
Address**: -** Department of Biology, Kogi State College of Education, Ankpa.

flagellated protozoan that has been associated with the vaginal pathogen and is typically located in the lower genitourinary tract. It has been recovered from the vagina, skin glands, Bartholin glands, and urethra of the female. *Trichomonas vaginalis* is transmitted by sexual contact. Approximately eight percent of female sexual partners of infected males become infected. However, research indicates that it is identified more frequently in pregnant women than in nonpregnant women (Han et al., 2019). *Trichomoniasis* infection is highly associated with the presence of other sexually transmitted diseases (STDs) such as gonorrhea. If contacted before or during pregnancy, this infection can cause serious health problems through preterm labor, premature rupture of the membrane, and neonatal infection (Elgebe, 2003). *Trichomonas vaginalis* has been isolated from the respiratory tract of infants with respiratory disease and the conjunctivae of several infants with conjunctivitis in newborns. Evidence suggests that the infants become infected during vaginal deliveries of infected mothers.

The present study

Evidence from Nigeria literature shows that *Candida albicans* and *Trichomonas vaginalis* is among the leading cause of infections among women and especially pregnant women (Adeoye & Akande, 2007; Akerele et al., 2002; Bello, 2012; Chigbu et al., 2006; Chuku et al., 2019; Mbakwem-Aniebo et al., 2020; Nnaemeka et al., 2016; Nwosu & Djieyep, 2007; Obiajuru & Ogbulie, 2005; Okonko et al., 2012; Udoh et al., 2020). An observation of the awareness of rural women in Kogi state, especially women attending ante-natal care in health institutions about the existence of *Candida albicans* and *trichomonas vaginalis*, shows that *C. albicans* and *T. vaginalis* could be responsible for the widely reported poor health care among pregnant women. Consequently, the scarcely identified *C. albicans* and *T. vaginalis* awareness programs in the state's education programs could be attributed to the lack of documented evidence relating to the distribution of *C. albicans* and *T. vaginalis* in Kogi state. Thus, this present study is aimed to determine the prevalence of infection among pregnant women in the rural communities of Kogi state of Nigeria. Therefore, the study's primary objective is to determine the extent of infection of *candidiasis* and *trichomoniasis* in pregnant women in Kogi state.

Method: -

Three hundred and thirty-six (n=336) pregnant women attending antenatal care in public health institutions across Kogi state were randomly selected as the study participants. The study was conducted between December 2020 and February 2021. A cross-sectional survey design was adopted. The participant's ages ranged between 30 and 45 years.

Sample collection and analysis

The study participants were recruited with the aid of clinicians attending to pregnant patients in the public health centers. A total of three hundred and fifty pregnant women were briefed on the purpose of the study in various ante-natal centers. However, three hundred and twenty-three consented to the study and were given the swab for sample collection. The samples were collected by the ante-natal care provider and were stored adequately for our retrieval. The samples were further subjected to laboratory analysis using the standard procedure similar to Udoh et al. (2020)

Result: -

Table 1: - Shows the outcome of the test conducted on the collected samples from the participants.

Test result	N	%
Candidiasis	206	61.3
Trichomoniasis	17	5.1
Non-infected	113	33.6
Total	336	100

The above table shows that the total number of infected participants supersedes the non-infected participants. A total of two hundred and six (n=206), representing 61.3% of the study's total population, tested positive for candidiasis caused by the *C. albicans*. Seventeen (n=17) of the population (5.1%) tested positive for *T. vaginalis*. While one hundred and thirteen (n=113) representing (33.6%) tested negative for both diseases.

Discussion: -

The primary objective of the current study was to determine the prevalence of *C. albicans* and *T. vaginalis* infections using a sample of women who are attending ante-natal care in the state's public health facilities. A total of three hundred and thirty-six vaginal specimens were pooled from participants through their consulting physicians.

The analysis conducted on the samples showed that in all, two hundred and six of the total vaginal specimens representing 61.3% of the whole samples tested positive for *C. albicans*, while seventeen representing 5.1% tested positive for *T. vaginalis*. However, one hundred and thirteen of the samples representing 33.6% were confirmed negative for neither of the fungi. Consistent with a previous study (Nwosu & Djieyep, 2007), there was no reported co-occurrence of the infection among the participants. However, the finding supported literature affirming the occurrence of this infection in women. For example, (see., Adeoye & Akande, 2007; de Paula Glehn et al., 2016; Mishra & Jain, 2020; Nwosu & Djieyep, 2007; Okonko et al., 2012; Yu et al., 2018).Evidence has shown that *C. albicans* is the primary cause of yeast infection that can be passed to the baby during delivery. More so, *T. vaginalis* has been linked with adverse pregnancy experiences comprising ruptures and preterm birth. However, research has documented several risk factors underlying *C. albicans* and *T. vaginalis* infections, and the probable remedial recommendations have been extensively stated (e.g., Glehn, Ferreira, Da Silva, & Machado, 2016; Konadu, et al., 2019; Abdul-Aziz et al., 2019; Bolumburu, et al., 2020; Gor, 2018). For instance, the high incidence of *C. albicans* and *T. vaginalis* infections is linked to poor personal hygiene and the composition of the female vaginal organ, which favors penetration and the installation of the infection. (Payne et al., 2020).

Practical implication

The study contributes to the infectious disease literature by providing evidence of the prevalence of. *albicans* and *T. vaginalis* infections in Kogi state. The study also provides valuable data to the Maternal and Child Survival Program (MCSP) of the United States Agency for International Development (USAID), which aims to improve maternal, newborn, and child health outcomes and other relevant health promotion agencies.

Conclusion: -

The present study was aimed to examine the prevalence of *C. albicans* and *T. vaginalis*. Consequently, the findings showed that the incidence of the infections persists in the study parameter. It is concluded that *C. albicans* and *T. vaginalis* infections as a public health concern are pervasive among pregnant women in the rural communities of Kogi state. Perhaps, this revelation is novel given the unavailability of documented data. Thus, it is recommended that robust enlightenment programs be instituted to inform women about the infection and overcome it. Furthermore, as Nsofor et al., (2016) noted, that the public should be enlightened on the dangers of tight underwear and indiscriminate use of antibiotics as measure to decrease the incidence of the disease.

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