RESEARCH ARTICLE

VULVO-VAGINAL CANDIDIASIS: PREVALENCE AND RISK FACTORS AMONGST ANTENATAL ATTENDEES AT A TERTIARY HEALTH-CARE FACILITY IN JALINGO, TARABA STATE, NORTH-EASTERN NIGERIA

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ABSTRACT

Background: Vulvo-vaginal candidiasis (VVC) continues to be a disease of global burden that affects all strata of society. Yeast cells belonging to the genera Candida are responsible for VVC with *C. albicans* being the most recovered specie.
Objective: To evaluate prevalence and risk factors associated with VVC among pregnant women. Materials and methods: 90 pregnant women within the ages of 15-39 years attending Taraba state specialist hospital were evaluated for VVC using saline mount microscopy, Gram-stained smear microscopy and culture. Information on socio-demographic and clinical features was obtained using a structured interviewer's questionnaire.
Result: 20% prevalence (18 out of 90) was recorded. Varying prevalence per character was obtained but all lacked statistical significance. Conclusion: A prevalence of 20% for VVC recorded in this study is considerably high. Maternal and neonatal well being is of paramount importance. Thus, medical, social and educational interventions aimed at reducing the prevalence and its consequent effects are highly recommended.

Key words: Vulvo-vaginal candidiasis, Prevalence, Risk factors, Pregnant women.

INTRODUCTION

Species belonging to the genera Candida happens to be the most important yeast opportunistic pathogen of medical interest (Akingbade *et al.,* 2013). Candida normally resides in the intestinal tract, lower genital tract and on the skin at reduced quantity without causing any infection (Akinbiyi *et al.,* 2008). Thus, their overgrowth or access to sterile body sites may result in disease formation. There are over 20 species of candida yeast with *C albicans* being the most recovered specie (Singh, 2003). Candida associated infection (candidiasis) are grouped into oropharyngeal (mouth, throat and eosphagus), invasive (blood stream invasion) and vulvo-vaginal. Vulvo-vagina candidiasis (VVC) is one of the most common fungi diseases in normal healthy women (Cohen, 2000) and remains a common problem world-wide affecting all strata of society (Ugwu, 2015).

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About 75% of women within the reproductive age-grade will have at least one episode of VVC while about 5% of healthy women will suffer from recurrent or relapsing VVC (four or more episodes per year) (Rex *et al.,* 2000). Prevalence of VVC varies among different study population and risk factors believed to be associated includes broad spectrum antibiotics abuse, oral contraceptive usage, high estrogen levels, douching, personal and communal hygiene and immuno-compromised status such as diabetes and HIV. Others are nylon underwear and tight insulating clothing, intake of high-glucose diet and pregnancy. Generally, women are said to present with clinical symptoms of VVC when high vaginal swab (HVS) yeast cell count is greater than or equal to 10^5 CFU/ml of vagina fluid (Jombo *et al.,* 2010). Symptoms generally include itching, burning, soreness, abnormal vaginal discharge, abdominal pains and obstruction of menstrual flow (Barousse *et al.,* 2005). Diagnosis of VVC based on patient's history and genital examination is prone to error because vaginosis caused by other pathogens tends to mimic candidiasis presentation. Thus, laboratory diagnosis which involves the isolation and identification of candida yeast via

wet mount (saline or 10% KOH) microscopy, Gram stained smear microscopy, culture on appropriate media and Germ tube test for species identification (Emeribe *et al.,* 2015) is often required for a definitive diagnosis. Aside vaginal discharge and abdominal discomfort, untreated VVC can result to pelvic inflammatory disease, scaring of the fallopian tube and consequent infertility in women. In pregnancy, VVC tends to double its prevalence. This can be ascribed to hormonal changes that results in alteration of normal vaginal pH and increase in glucose availability required for candida growth, germination and proliferation (Ibrahim *et al.,* 2016). Early laboratory diagnosis and appropriate treatment with antifungal via oral or topical administration may improve the clinical condition of women and neonates. Thus, this study seeks to evaluate the prevalence and risk factors associated with VVC amongst pregnant women in Jalingo, Taraba State, North-East Nigeria.

MATERALS AND METHODS

Study design and site

The study is a cross-sectional descriptive study conducted at the department of obstetrics and gynecology and the department of laboratory services (Medical microbiology unit) of Taraba State Specialist Hospital Jalingo, a tertiary health-care facility that serves as a referral center for other parts of Taraba, Benue and Adamawa States. Jalingo is the capital city of Taraba State with an estimated population of 118,000 persons. The residents are predominantly farmers, traders and public/civil servants.

Study population

All pregnant women attending antenatal care clinic for the first time from July through September 2017, were recruited for the study. A total of 90 pregnant women within the ages of 15-39 years were selected and enrolled for the study, regardless of ill-health or retroviral status.

Socio-demographics

A structured interviewer's questionnaire was administered to participants. It accessed information on age, religion, parity, occupation, level of education, trimester and previous history of Sexually Transmitted Infections (STI).

Sample collection

The vagina was examined for the presence of vaginal discharge after the insertion of a vaginal speculum. Vaginal discharge status was recorded and part of the secretion collected with the aid of a sterile swab stick (two per participant) from the lateral and or posterior for mix of the vagina. The samples were collected, labeled at the antenatal clinic and sent immediately to the laboratory for processing.

Sample processing: Microscopy

A saline mount and Gram-stained smear of the HVS sample was examined microscopically. Saline mount was examined using x40 magnification to detect yeast cells with characteristic budding while Gram-stained smear was examined using x100 for large gram-positive cocci or/and gram-positive budding yeast cells.

Culture

An innoculum pool was made using each HVS specimen on Sabouraud Dextrose agar (SDA). Streaking was done with the aid of a wire loop to recover isolate as discrete colonies. Yeast cells were identified using characteristic colonial morphology of candida on SDA

Data analysis

Data were recorded on an excel spread sheet and analyzed using SPSS 23. Prevalence was expressed in simple percentage and statistical association between socio-demographics, clinical features and candidiasis was evaluated using Pearson's chi-square or Fisher's exact test at a confidence limit of 95% with p-valves < 0.05 regarded to be significant.

Ethical Consideration

The study was approved by the Ethics Committee of Taraba State Specialist Hospital Jalingo. All the participants gave consent to collaborate voluntarily and confidentiality of data recorded were assured and kept.

RESULTS

A total of 90 pregnant women between the ages of 15-39 years with mean age of 27+ 7.1 years participated in the study. Majority of them were Christians (56.7%), in their third trimester (48.9%), have 1-3 children (52.2%) and have a previous history of STI (63.7%). Table 1 summarizes the characteristics of the study population.

Table 1. Characteristics and frequency of the study population

Characteristics	Frequency	Percentage (%)
Age (years)		
<20	20	22.2
21-30	39	43.3
31 and above	31	34.5
Religion		
Christianity	51	56.7
Islam	39	43.3
African traditional	0	0.0
Trimester		
Ist	8	8.9
2nd	38	42.2
3rd	44	48.9
Parity		
None	35	38.9
1-3	37	52.2
4 and above	8	8.9
Educational level		
Primary	12	13.3
Secondary	37	41.1
Tertiary	41	45.6
Occupation		
Unemployed	55	61.1
Self-employed	16	17.8
Formal setting workers	19	21.1
History of STI		
Yes	57	63.3
No	33	36.7
Vaginal discomfort		
Yes	58	64.4
No	32	35.6

Table 2. Number of women with candidiasis

Candidiasis	Frequency	Percentage
Positive	18	20
Negative	72	80
Total	90	100

Of the 90 pregnant women, 18 (20%) had candidiasis

Table 3. Calculated p-value for all characters

Character	Candidiasis Pos	Percentage Pos	Candidiasis Neg	Percentage Neg	P-value
Age (years)					0.502
<20	3	15.0	17	85.0	
21-30	10	25.6	29	74.4	
31 and above	5	16.1	26	83.9	
Religion					0.560
Christianity	10	19.6	41	80.4	
Islam	8	20.5	31	79.5	
African trad.	0	0.0	0	0.0	
Trimester					0.430
Ist	1	12.3	7	87.5	
2nd	10	26.3	28	73.7	
3rd	7	15.9	37	84.1	
Parity					0.290
None	8	22.9	27	77.1	
1-3	7	14.9	40	85.1	
4 and above	3	37.5	5	62.5	
Educational level					0.236
Primary	3	25.0	9	75.0	
Secondary	10	27.0	27	73.0	
Tertiary	5	12.2	36	87.8	
Occupation					0.464
Unemployed	13	23.6	42	76.4	
Self-employed	3	18.8	13	81.2	
Formal setting workers	2	10.5	17	89.5	
History of STI					0.124
Yes	14	24.6	43	75.4	
No	4	12.1	29	87.9	
Vaginal discomfort					0.315
Yes	13	22.4	45	77.6	
No	5	15.6	27	84.4	

None of the p-values was significant

DISCUSSION

The prevalence of 20% recorded in this study is in consonant with the report of Nandan *et al.* (2011) and Aring *et al.* (2012) who gave 21.31% and 19% respectively (Nandan *et al.,* 2011) (Aring *et al.,* 2012) but disagrees with Kamara *et al.* (2000) and Okonkwo and Umeanaeto (2010) who gave 30.7% and 30% for Jamaica and Anambra State South-Eastern Nigeria respectively. However, this study prevalence is far lower than the report of Onisade and Olomnfemi (2005) and Ugwa (2015) who recorded figures as high as 81.5% and 84.5% respectively. Emeribe et al (2015) reported a prevalence of 14% for non-pregnant women in Abuja, a figure lower than ours. The variation in prevalence recorded for the above mentioned studies may result from difference in population studied, diagnostic technique or methods used, cultural and social practices and literacy level. Age-based prevalence revealed that participants within the age grade of 21-30 years gave the highest prevalence of 25.65. A notion supported by Emeribe *et al.* (2015) and Ezeigbo and co-worker (2015) but in contrast to Alo *et al.* (2012) who reported 36-40 years old women as its highest VVC prevalent age group. High sexual activity, high incidence of antibiotics abuse and contraceptive usage associated with this age group may be responsible for the high prevalence recorded. This is also a pointer that sexual activity is a risk factor for VVC even though it is not a sexually transmitted disease. Women in their second trimester gave the highest number of positive cases (10 out of 38). This finding correlates with the report Yadav and Prakash (2016), Deepa *et al.* (2014) and Oyewole *et al.* (2013) but disagrees with Ezeigbo *et al.* (2015) and Okonkwo and Umeanaeto (2010) who reported women in their third trimester to account for more VVC cases. Parity based prevalence gave 37.5% for women with 4 and above number of kids as its highest prevalence. A finding in consonant with Arul *et al.* (2017) but in contrast to Olaniran *et al.* (2015) who recorded primigravid women to account for the highest number of VVC cases.

Non-tertiary degree holders (primary and secondary) gave a prevalence of 25% and 27% respectively while tertiary degree holders had 5% prevalence. Similar findings have been reported by Yadav and Prakash (2016) and Ezeigbo *et al.* (2015). Unemployed women gave the highest occupation based prevalence (23.6%). Similar finding was also obtained in the study conducted by Yadav and Prakash (2016). Ignorance, low economic status, poor personal and communal hygiene as well as hesitance to approach medical services may be responsible for the high prevalence of VVC among non-tertiary degree holders and unemployed women. Women with previous history of STI and those presenting with vaginal discomfort had more VVC cases.

Conclusion

20% prevalence obtained in this study is considerably high. Low income, sexual activity, previous history of STI, ignorance as well as poor personal hygiene has been implicated as possible risk factors. Efforts should be focused on improving access to quality social amenities, health care services, prompt diagnosis and treatment of STI and vaginosis as well as increase in health and sex education for women via all possible routes. Microbiological analysis of HVS for all pregnant women during their first antenatal visit is also recommended.

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