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Prevalence and Factors Associated with Vulvovaginal Candidiasis among Pregnant Women Who Attended Antenatal Clinic at Kamuli General Hospital

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ABSTRACT

Candidiasis is a fungal infection caused by a related group of yeasts whose manifestations may be localized on the skin, rarely may be systemic and life-threatening. Vulvovaginal Candidiasis (VVC) is the second most common cause of vaginitis and commonly presents with vulva pruritus, vaginal discharge, dysuria, and dyspareunia, approximately 10% of women experience repeated attacks of Vulvovaginal Candidiasis without precipitating risk factors. This research is to assess the prevalence of Vulvovaginal Vaginal Candidiasis among pregnant women who attended Kamuli General Hospital. A cross-sectional qualitative and quantitative prospective study was used to recruit a total sample size of 15o pregnant women who consented to take part in the study and adhered to the recruitment procedures. Majority of the pregnant women were aged 16-25 years 60(40%) and the minority were aged 36-45 years 36(24%), Basoga were dominant with 112(75%), majority of the pregnant women were married 122(81.3%), those who never went to school were 54(36%), Catholics accounted for 56(36%) as the highest in terms of religion, house wives were102(68%) while business women accounted for 32(21.3%). A total of 63(42%) positive isolates were identified, 86% reported itching as the predominant symptom, 49% reported bad odor and burning constituted for 27%. Of the 63 positive cases with VVC, 53(84.1%) were registered among married pregnant women while the least 01(1.6%) Occupation (p=0.02) and trimester (p=0.017) of the pregnant women showed statistical significance to prevalence of VVC. The prevalence of VVC among pregnant women who attended Kamuli General Hospital was established as 42%, results showed that (84.1%) prevalence was registered among married. There is great need for health education to explain to the girls, issues concerning their health. This should be done at least twice in every term.

Keywords: Vaginitis, Fungal infection, Vulvovaginal Vaginal Candidiasis, Married pregnant women, Health education.

INTRODUCTION

Candidiasis is a fungal infection caused by a related group of yeasts whose manifestations may be localized on the skin, rarely may be systemic and life threatening [1]. Vaginal Candidiasis is a yeast genital infection caused by Candida albicans and is one of the most common causes of Vulvovaginitis in around 80-92 percent of cases in women of all ages. Other non albicans species like Candida tropicalis, Candida glabrata, Candida krusei and Candida parapsilosis can also cause similar symptoms although sometimes severe and recurrent [2]. The high concentration of estrogen hormone during pregnancy provides favourable environment for the growth of Candida. [3]. Some of the factors that increase the risk of developing yeast infection include; broad spectrum antibiotic use which kill a range of bacteria as well as the health bacteria of the vagina leading to over growth of yeast organisms, uncontrolled diabetes, impaired immune system such as from corticosteroid therapy or HIV infection, sexual activity, increased estrogen levels due to pregnancy or taking high doses of estrogen birth control pills [4].

During pregnancy, the levels of estrogen increase and this causes the vagina to produce more glycogen, making it easier

for yeast to grow there. Some researchers think estrogen may also have a direct effect on yeast, causing it to grow faster and stick more to the walls of the vagina. Pregnancy being an immunosuppressive state intended for fetal allograft implantation and development can also favor the growth of normal flora. Candidiasis is thus more common in pregnant women than in other times of a woman's life [5]. Vulvovaginal Candidiasis (VVC) is the second most common cause of vaginitis and commonly presents with vulva pruritus, vaginal discharge, dysuria, and dyspareunia, approximately 10% of women experience repeated attacks of Vulvovaginal Candidiasis (VVC) without precipitating risk factors. Physical examination findings include vagina and labia that are usually erythematous, a thick curd like discharge and a normal cervix upon speculum examination [6]. According to [7], Vaginal Candidiasis can have several adverse effects in pregnancy, causing preterm labor, preterm rupture of membranes (PROM), spontaneous abortion, premature birth, neonatal infection and postnatal morbidity and mortality in the mother. [7], further noted that when Candidiasis is not diagnosed in pregnancy, it not only causes psychological and physical stress to the mother but the fetus is most likely to acquire the fungus via the birth canal during delivery leading to neonatal Candidiasis of the oral pharynx. This presents with visible white plaques on the oral mucosa and the under lying mucosa is inflamed and friable, causing feeding to be very difficult. Infection of Candidiasis from the neonate's mouth to the mother's breast can occur during breast feeding causing the nipples to be inflamed and sore. The Candida can spread from the nipple cracks to become systemic via blood vessels. Persistent infection is common in breastfed infants as a result of colonization or infection of the mother's nipples. Thus, treatment of the neonate and the mother should be done at the same time [8]. Candida species are the second most common cause of VulvoVaginiitis and is a common problem globally. Approximately 75% of the female population suffers at least one episode during their lives with 40-50% getting more than one episode and the incidence of Candidiasis estimated that up to 40% of pregnant women have vaginal Candidiasis worldwide [9], with a systemic estimated mortality rate of about 70-80% [10]. In United States VVC is the second leading cause of vaginitis next to bacterial vaginitis and it is also common in Europe [11].

Statement of Problem

Vulvovaginal candidiasis (VVC) is a public health problem worldwide, affecting all strata of females with approximately 75% of the female population suffering at least one episode during their lives and the incidence of Vulvovaginal candidiasis among pregnant women is about 40% worldwide [9]. This contributes to estimated mortality rate of about 70-80% [10]. In Africa Nigeria, also revealed a high prevalence of VVC of approximately 70%, followed by Uganda at 60% and Kenya with 42.7%.[12]. In Uganda, Vulvovaginal Candidiasis affects about 60% (651,600) pregnant women [13], with estimated recurrent rates of Candida vaginitis ($\geq$ 4 episodes/year) in about 5% of adult women [5], VCC complicates pregnancy as it leads to UTI, PID and Chorioamnioitis which are cardinal in causing abortion, premature birth, Low birth weight, Maternal and Fetal death. Multiple studies have explained a strong association of VVC and a couple of factors such as pregnancy, uncontrolled diabetes, use of antibiotics, oral contraceptive, immune suppression status, over use of perfume, use of contraceptive, among others [14]. However, scanty data exist on the prevalence and associated factors of VVC among pregnant women in eastern Uganda including Kamuli district, therefore, the main objective of this study is to establish prevalence and associated factors of VVC among pregnant women who attended Kamuli General Hospital, so as to inform stakeholders in appropriate interventions to prevent and control VVC among pregnant women in the area. The research work will assess the prevalence and factors associated with vulvovaginal candidiasis among pregnant omen who attended antenatal clinic at Kamuli general hospital.

METHODOLOGY

Study Design

A cross sectional qualitative and quantitative prospective study was used to determine the prevalence of VVC among pregnant women at Kamuli General Hospital, where a documentary review were carried out on the ANC records at the Hospital to cater for a period of six months (December 2021- April 2022) A quantitative research attempted to establish statistically significant relationships and address questions by measuring and describing which was based on objective measurement and observation and was concerned with correlation and causation [15]. Also, across sectional quantitative study was done to ascertain the number of pregnant women attending Kamuli General Hospital with Vulvovaginal Candidiasis and those at a risk of getting VVC, since it is relatively quick, economical, and easy to manage [5].

Area of Study

The study was conducted at Kamuli General Hospital located in Kamuli Municipality constituency, Kamuli Municipality parish, Southern division Sub-county, Kamuli district in the eastern region of Uganda. It's located approximately 136 kilometres from Kampala town the capital city of Uganda. More data about Kamuli Hospital in terms of beds and patient numbers

The health facility is the biggest health facilities in the district and it offers many health care services including; Family planning, ENT clinic, Child health services, Emergency care, HIV/AIDS management services, General patient management, Laboratory services, Nutrition services, Antenatal and postnatal services, EMTCT program as well as RCT services among many others. The study setting was selected because it was familiar and well known to the researcher and therefore this meant that the required number of respondents and all other research activities were done accurately at a minimum cost.

Study Population

The study was conducted among pregnant women of reproductive age who attended ANC in Kamuli General Hospital.

Sample Size Determination

Determination of the sample size was done by use of Kish Leslie (1965) formula.

$$n = \frac{ZP(1-P)}{E^2}$$

Where: n= Estimated minimum Sample size.

Z =1.96 for 95% Confidence interval.

P = Proportion of a characteristic sample. (20.7%) [16].

E = Margin of Error (E = 5%)

$n = 1.96^2 x (0.207) (1-0.207)) / 0.05^2$

n= 150 pregnant women

Sampling Technique

Sampling is the process of selecting a proportion of the population to represent the entire Population so that inferences about the population can be made [17]. For this study, a non-probability convenient sampling technique was used because it l saved time for both the respondents and the research.

Sampling Procedure

The respondents for the study were selected using convenience sampling procedure. This was done in the way that researcher will offer all the potential, available respondents an opportunity to participate in the study. This process continued until the number of respondents that were interviewed per day was achieved.

The independent variables for the study included:

Social demographic characteristics of pregnant women, maternal factors and behavioral factors contributing to the prevalence of VVC.

The dependent variables for the study included

Prevalence of VVC among the respondents.

Data Collection

A systematic plan was drawn that involved the collection of data from respondents using a simple interview panel after the interview, a high vaginal swab sample was collected by the clinician from each consenting study participant.

Data Collection Procedure

Vaginal cotton wool swab was inserted into the posterior vaginal fornix making sure it does not touch the surface of the vulva. The swab was then rotated gently against

the vaginal wall. Additionally, the swab was then pulled back and put in a container and the speculum removed. The swab container was uniquely labeled and was taken to the laboratory and examined immediately. Wet preparation was briefly performed, new frosted glass slide was cleaned using Isopropyl alcohol and were labeled. A drop of normal saline was also placed on the slide and the high vaginal swab sample were emulsified on the slide. A cover slip was applied on the slide and mounted on the microscope then observed under X10 and X40 magnification for presence of yeast cells. Known positive and negative slides (066-P and 066-N) were generated and used at the Microbiology laboratory in Kamuli General Hospital.

Data Collection Tools.

This involved the use of high vaginal swabs, cotton wool, pens, rules, record books and normal saline.

Data Analysis

In this section, raw data collected was cleaned, coded, analyzed, Processed and analyzed using Ms Excel and IBM SPSS version 20.0. Variables were cross-tabulated and their respective results were presented in simple frequency tables, pie charts and graphs.

Quality Control

Questionnaires were pre tested and necessary corrections were made. After collecting of data, the researcher went through each interview guide to confirm the completion. If any were found incomplete, they were corrected before leaving the area of study and losing contact with the respondents.

Inclusion Criteria: The study included only Adult pregnant women who were able to consent on their own as long as they were registered members of Kamuli General Hospital ANC.

Exclusion Criteria: The study eliminated respondents who never sought for health care services at Kamuli General Hospital in addition; all those respondents who never consented and were not pregnant were eliminated from the study.

Training of Research Assistants: Self driven and competent Research assistants were trained for 2 days and given a mock test to ensure absolute knowledge on the subject matter in order to equip them with the knowledge and skills for carrying out tasks of sampling, giving clear introduction to the interviewee and performing the interview accurately and correctly according to the developed procedure.

Ample Time for Data Collection: Duration of 10 days was considered ultimate to for entire collection cycle for this study that is to say; gathering of raw facts, categorization of data according to variables, classifying data, cleaning of data or verification. These activities made data ready of statistical analysis.

Ethical Consideration.

The study was conducted upon approval by the supervisor. This was followed by obtaining of a letter of introduction from the school administration which was then presented to the Hospital management upon arrival at the facility. Permission from the Health facility or management was sought for to proceed with the research before embarking on data collection.

The participants were explained to, the importance of their participation in the study and possible benefits of the findings to their communities. The investigator also took measures in obtaining informed consent from the participants by giving them consent forms to fill before taking part in the study and ensuring that the freedom, dignity, confidentiality and autonomy of the participants as independent human beings were respected. There was willful joining and exit from the study. No coercive methods or intimidation or any rewards in the process of obtaining data from the participants were employed. Plagiarism was avoided by paraphrasing and citations of other scholars' works.

RESULTS

Demographic Data of Respondents

Table 4.1 shows the demographic data of the 150 respondents who participated in the study.

The study revealed that, the majority of the pregnant women were aged 16-25 years 60(40%) and the minority were aged 36-45 years 36(24%) In terms of the tribe, Basoga were dominant with 112(75%), while other tribes constituted only 7(4%) For marital status, majority of the pregnant women were married 122(81.3%) and the minority of the respondents represented others 4(2.7%) According to the variable of highest education level attained, most pregnant women who attended Kamuli General Hospital never went to school 54(36%) and only 12(8%) had attained a tertiary institutional qualification. Religion wise, most of the pregnant women who attended to Kamuli General Hospital were Catholics 56(36%), followed by protestants 40(26%), while Muslims and other denominations accounted for (28%) of all the study participants. The highest number of pregnant women were house wives 102(68%), business women accounted for 32(21.3%), both civil servants and other diverse professions as depicted in Table 4.1 all had a distribution share of 08(5.3%).

Table 1 Showing Biodata Distribution of Respondents

Variables	Category	Frequency	Percentage
Age group	16-25	60	40
	26-35	54	36
	36-45	36	24
Tribe	Basoga	112	75
	Bagisu	18	12
	Baganda	13	9
	Others	7	4
Marital status of care taker	Married	122	81.3
	Single	18	12
	Separated	6	4
	Others	4	2.7
Education level	Primary	46	25.3
	Secondary	38	31
	Tertiary	12	8
	None	54	36
Religion	Catholics	56	36
	Protestant	40	26
	Moslems	24	15
	Others	36	23
Occupation	Civil servant	08	5.3
	Business woman	32	21.3
	House wife	102	68
	Others	08	5.2
Total		**150**	**100**

Source: Field Kamuli General Hospital

Prevalence of VVC in Pregnancy.

Total numbers of one hundred and fifty [150] samples were collected for isolation and identification of Candida species from all the pregnant women who attended Kamuli General Hospital. A total of 63(42%) positive isolates were identified with VVC while 87(58%) were negative as represented in figure 1.

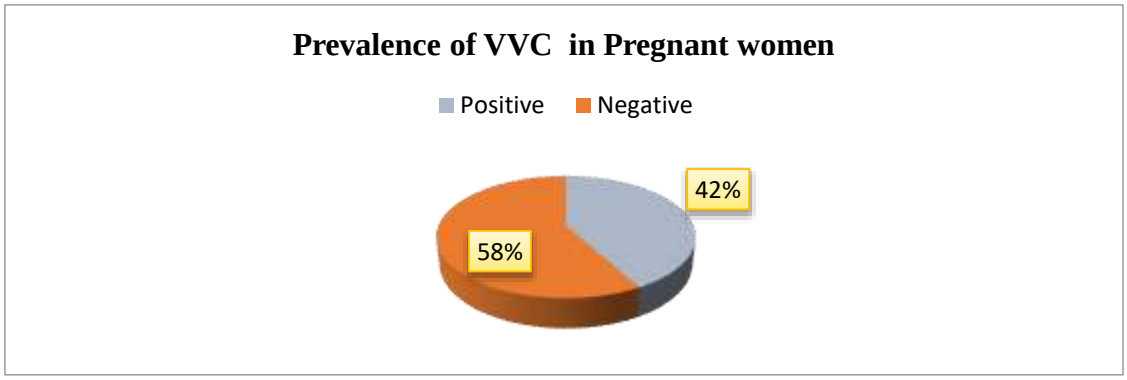

Figure 1 Showing the prevalence of VVC among pregnant women.

Prevalence of VVC According ot Age Group of Pregnant Women Who Attended Kamuli General Hospital

Candida species were isolated with higher percentage 28 [46.7%] from women aged between 16-25 years old, 22[40.7%] from women aged between 26-35 years old and the lowest percentage 13 [36.1%] were isolated from women aged between 16-25 years old as showed in Figure 2.

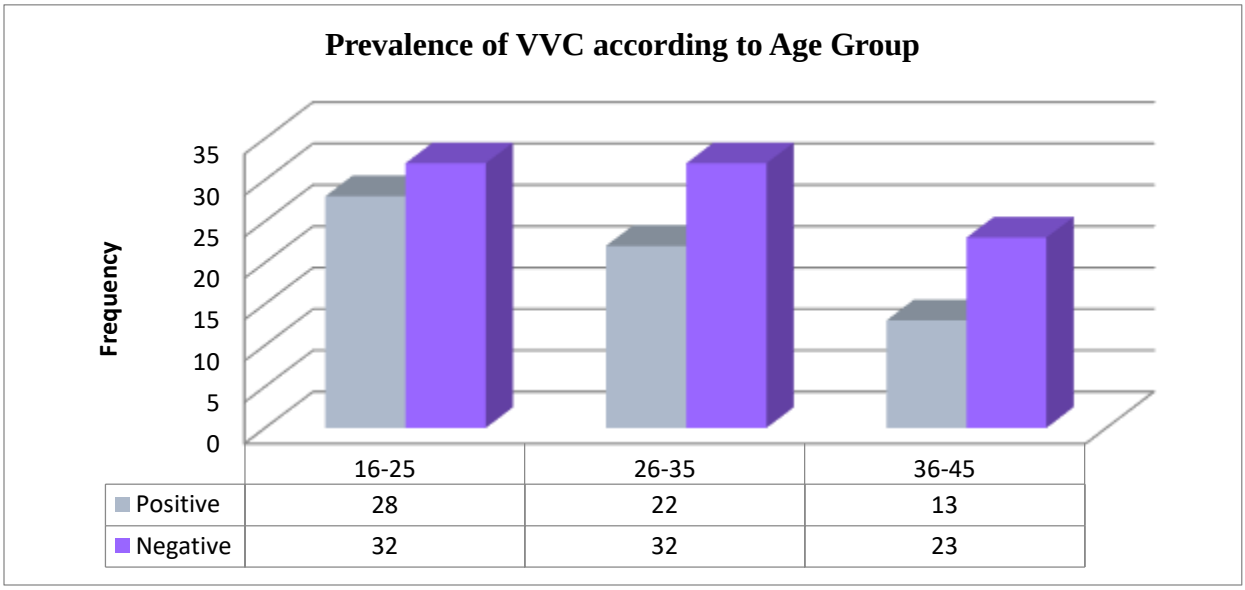

Figure 2 showing the prevalence of VVC according to age group of the pregnant women

Symptoms of VVC among Pregnant Women

Figure 2 showed that Discharge was the commonest symptom reported among the pregnant women with 86%, itching was reported by 49% while bad odor and burning constituted for 27% and 12 % respectively.

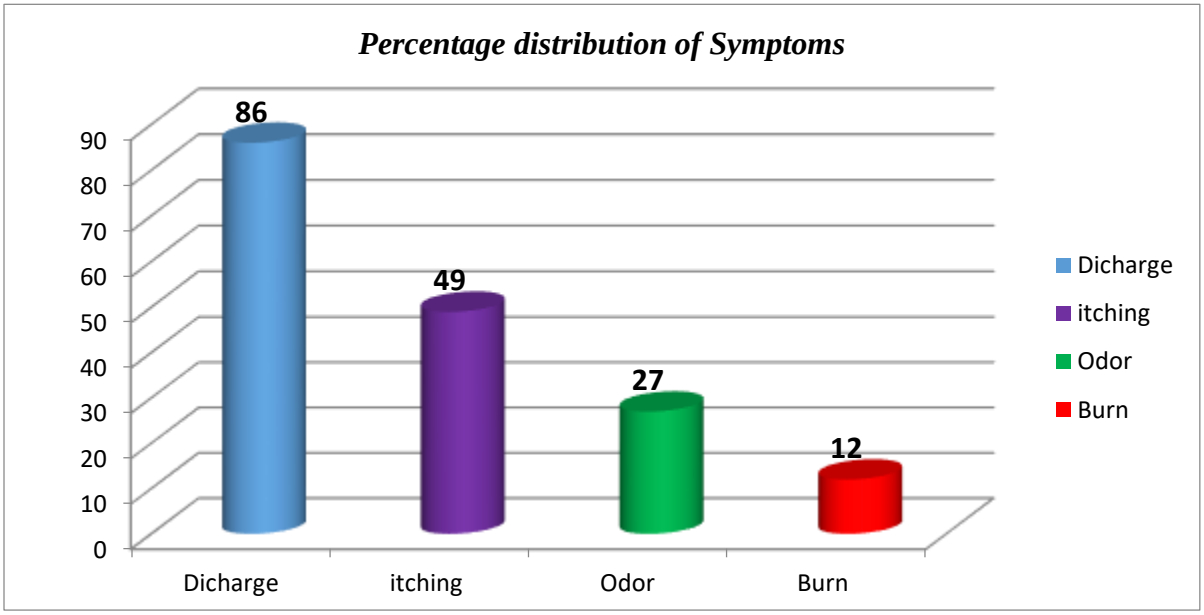

Figure 3: showing percentage distributions of Symptoms of VVC

Table 2: Sensitivity of different methods used to detect Candida species

Method	Positive samples	Percentage
Wet mount	53	84.1
Gram stain	55	87.3
Culture	63	100

Source: Field Kamuli General Hospital

Table 2: showed that Culture, direct gram stain and wet amount were used to identify *Candida* species, culture showed the higher rate of yeast isolating, while direct gram stain and wet mount preparation showed almost similar result.

Socio- Demographic Factors and Prevalence of VVC

Of the 63 positive cases with VVC, 53(84.1%) were registered among married pregnant women while the least 01(1.6%) were registered among others, education wise, the highest prevalence of VVC was registered among those who had never gone to school 37(58.7%) and the lowest prevalence was registered among those who had acquired tertiary level education with 04(6.3%). In terms of religious affiliation, Catholics had the highest delivery of positivity thus 20(31.7%) while on the other hand other Muslims displayed only 10(15.9%) of the cases with VVC.

The occupation with the highest positivity was those of housewives that exhibited 47(75%) while others displayed only 01(1.6%) of positive cases. Additionally, only occupation of the pregnant women who attended at Kamuli General Hospital showed a significant statistical association with prevalence of VVC as depicted in Table 2.

Table 3: Prevalence of VVC according to socio- democratic characteristics

n= 150

Variables	Category	Frequency	Positive	Negative	p- value
Marital status	Married	122	53(84.1%)	69(79.3%)	
	Single	18	08(12.7%)	10(11.5%)	*p= 0.238*
	Separated	6	01(1.6%)	05(5.7%)	
	Others	4	01(1.6%)	03(3.4%)	
Education level	Primary	46	19(30.2%)	27(31%)	*p=0.532*
	Secondary	38	13(20.6%)	25(28.7%)	
	Tertiary	12	04(6.3%)	08(9.2%)	
	None	54	37(58.7%)	27(31%)	
Religion	Catholics	56	20(31.7%)	36(41.4%)	*p=0.061*
	Protestant	40	18(28.6%)	22(25.3%)	
	Moslems	24	10(15.9%)	12(13.8%)	
	Others	36	15(23.8%)	21(24.1%)	
Occupation	Civil servant	08	03(4.8%)	05(5.7%)	*p=0.002*
	Business woman	32	12(19%)	20(23%)	
	House wife	102	47(74.6%)	55(63.2%)	
	Others	08	01(1.6%)	07(8%)	
Total		**150**	**63**	**87**	**P<0.05**

Source: Field Kamuli General Hospital

Maternal Factors and Prevalence of VVC

The highest positivity of VVC was registered among pregnant women with their 2nd parity 29(46%), both 3rd and those who had produced more than 4 times registered the smallest prevalence of VVC with 05(7.9%) correspondingly. In terms of trimester, the 2nd portrayed the highest number of VVC cases with 26(41.3%) while the least positivity was taken from 3rd trimester pregnant women as showed in Table 3. In addition, non-*Diabetic* pregnant mothers demonstrated the highest number of positive cases 46(73%) compared to those who had *Diabetes* Mellitus 17(27.5%) Similarly, HIV/AIDS patients had the lowest prevalence of VVC (12.7%) compared to the 87.3% those who were negative. It was also established that only trimester of the pregnant women showed statistical significance (p=0.017) to prevalence of VVC while other variables like parity, Diabetes Mellitus and HIV/AIDS showed no statistical relationship.

Table 4 Showing Maternal Factors for Prevalence of VVC

Variables	Category	Frequency	Positive	Negative	p- value (p<0.05)
Parity	1st	41	14 (22.2%)	27(31%)	*p= 0.535*
	2nd	53	29 (46%)	24(27.6%)	
	3rd	25	05(7.9%)	20(23%)	
	>4	31	05(7.9%)	26 (30%)	
Trimester	1st	38	20(31.7%)	18(20.7 %%)	***p=0.017***
	2nd	54	26(41.3%)	28(32.2%)	
	3rd	58	17(27%)	41(47.1%)	
Diabetes Mellitus	Diabetic	31	17 (27%)	14(16.1%)	*p=0.286*
	Non diabetic	119	46(73%)	73(83.9%)	
HIV/AIDS	Positive	11	08(12.7%)	03(3.4%)	*p=0.483*
	Negative	139	55(87.3%)	84 (96.6%)	
Total		**150**	**63**	**87**	

Source: Field Kamuli General Hospital

Behavioral Factors for Prevalence of VVC
The use of Oral contraceptives showed a lower prevalence or positivity rate to VVC compared to non-use 46% versus 54% as showed in Table 4.4. The use of the Inter Uterine Device registered only 4(6.3%) of positive cases among pregnant women while non-use participants reported a whopping 93.7% of positivity. Use of anti-biotics among pregnant women manifested positivity to VVC to the tune of 54(85.7%) while non-use only showed a meager 9 (14.3%) positivity among the respondents.

Likewise, Corticosteroid use was only reported among a few study participants. This showed a smaller positivity rate to VVC 9(14.2%) On the other hand the non-users of Corticosteroid represented a positivity rate of 54(85.7%) respectively. All the behavioral factors that were considered in this study thus Oral contraceptives use, I.U.D, Use of Anti Bionics and Corticosteroid Use showed no statistical significance with the prevalence of VVC among pregnant women who attended to Kamuli General Hospital.

Table 5: Showing Behavioral Factors for Prevalence of VVC

Variables	Category	Frequency	Positive	Negative	p- value (p<0.05)
Oral contraceptives	No	97	34 (54%)	63(72.4%)	p= 0.810
	Yes	53	29 (46%)	24(27.6%)	
I.U.D	No	137	59(93.7%)	78 (89.6%)	p=0.412
	Yes	13	4(6.3%)	9(10.4%)	
Use of Anti Bionics	No	21	9 (14.3%)	12(13.8%)	p=0.231
	Yes	129	54(85.7%)	75(86.2%)	
Corticosteroid Use	No	134	54(85.7%)	80(92%)	p=0.526
	Yes	16	9 (14.2%)	7(96.6%)	
Total		**n=150**	**63**	**87**	

Source: Field Kamuli General Hospital

DISCUSSION

Socio Demographics of the Study

Candida species were isolated with higher percentage 28 [46.7%] from women aged between 16-25 years old and lowest percentage 13 [36.1%] were isolated from women aged between 16-25 years old as showed in Figure 2. These results are consistent with [18], who reported that, a 48.6% incidence rate within age bracket 20 - 30 years was established in Northern Nigeria. The rationale for this nature of results is that VVC infection was at a higher frequency in this age group than the other age groups due to high sexual activity and the fact that women in this age group are likely to indiscriminate drug usage and use of contraceptives to prevent pregnancy as portrayed by [19]. Additionally, [20], conveyed that age group 26–35 years had the highest occurrence of VVC in his results with a prevalence rate of 50%. Also, in Benin City [21], documented a 55% incidence rate within age group 26 - 35 years. [22] Similarly recorded a high 53% prevalence of VVC in Edo state in Nigeria. One of the highest prevalence rates of 57% was reported by [1], in Libya because of the high rates of teenage marriages. Studies with lower prevalence in comparison with this includes among others; [11] whose that was carried out in rural India revealed that VVC was more common in the age group of 21-25 years of age with 37.5%. A study that was done in Nishtar Hospital found that VVC the age group of 31-40 years was 35% [23]. The most affected women with VVC were in the age group of 20-24 years with 32% incidence [24]. As recorded by [25], age group of 16-20 years had a 26% prevalence rate of VVC. Of the 63 positive cases with VVC, 53(84.1%) were registered among married pregnant women as showed in Table 4.2. In line with the above prevalence, Length (2013) in Onitsha ,Nigeria found out that married women experienced more VVC of 43% compared to the rest of out of population. However [6], in his study in Addis-Ababa noted that VVC was more in the divorced women with frequency of 53% compared to the un married 42%. A rather highest prevalence of 87% was reported by [17], in Mulago hospital, Uganda. Education wise, Table 4.2 showed that the highest prevalence of VVC was registered among those who had never gone to school 37(58.7%) supplementary results from Women who were illiterates, show that that they suffered more VVC than those who had attended primary level and above with a frequency of 55.3% as denoted by [6] in Ethiopia. Furthermore [26] in their study that was done in Nepal, expounded that illiterates had a higher a high prevalence

rate of 36% Some researchers reported a mix up of results that contradict with this study findings for instance [15], acknowledged that pregnant women who studied up to a bachelor's degree in their study that was done in Ishaka, Bushenyi Uganda had a 40% prevalence of VVC 40% of the women who had VVC had attended secondary education. In Cameroon, [27] reported that Pregnant women who had stopped from primary level had the highest incidence of VVC of 50% frequency followed by those who had stopped from secondary with 34% frequency. In terms of religious affiliation, this study revealed that Catholics had the highest positivity of (31.7%). Almost the same results were obtained by [17] in Mulago, Uganda who attained a 36% prevalence of VCC among Catholics followed by Muslims with 27% incidence. Although other dissimilar results were registered for instance, [15]. Another divergent study by [28], showed that Muslim women had more chances of getting VVC compared to non-Muslims. This study established that housewives exhibited (75%) of the positive cases. The underlying reason is because majority of the respondents in this study were married and were always keen to seek for medical attention. Conflicting results were obtained in Onitsha Nigeria which designated that traders had the highest prevalence of 33% with VVC positivity. [29]. A Similar finding to that of Length (2013) was accomplished in Arua, Uganda by [5], which showed that over 50% of petty or small-scale traders were diagnosed with VVC. A rather conflicting study was done in rural India which revealed that 68.3% of the women who had VVC were un employed and most of them were farmers by profession [11]. In the same way, [30], in Niger delta region, Nigeria uncovered that 26% prevalence of VVC in women occurred among those who were unemployed among those who sought for health care issues at Delta teaching hospital.

Maternal Factors

The highest positivity of VVC was registered among pregnant women with their 2nd parity (46%), both 3rd and those who had produced more than 4 times registered the smallest prevalence of VVC (7.9%) correspondingly. A list of similar studies present multi grivida for higher prevalence of VVC than prime gravida for example a 54% prevalence by [17] in Mulago hospital Uganda, [28], in southern India with 41% prevalence of VVC in PG, [9] in Mangalore a coastal city in south India a 70 % prevalence, [4] with a prevalence of 66% in AI-Hada Military Hospital in Tarif, Saudi-Arabia. Furthermore, in terms of trimester, the 2nd portrayed the highest number of VVC cases with 41.3% while the least positivity was taken from 3rd trimester pregnant women as showed in Table 4.3. a related study that was done in Sree Balaji Medical College and Hospital by [3], found out that 56.5% of the pregnant women with VVC were in their third trimester. Similarly, [5] had the same findings in a study conducted in Arua, Uganda. In agreement with the above findings, [31], in their study in South Nigeria noted that 93% of the participants that had VVC were in their 3rd trimester of pregnancy. Another study by [32], conducted among pregnant women in Anambra state, Nigeria established a statistical significance between prevalence of VVC 3rd trimester (6.163;df =2) (P<0.05) Divergent results were however documented by [8] in Iraq in Tirkit Hospital which revealed that there was a high prevalence of 37% with VVC in women amongst 1st trimester of pregnancy out of the 120 respondents. In addition, this study noted that non-*Diabetic* pregnant mothers demonstrated the highest number of positive cases 46(73%) compared to those who had Diabetes Mellitus 17(27.5%) Contrasting findings were obtained concerning the above finding for example In a study done by [33] in Chiapas diabetes was a risk factor for the presence and prevalence of VVC. Additionally, Diabetes mellitus was one of the causes of VVC in women of child bearing age [34]. Correspondingly, [30] in Delta University Teaching Hospital revealed that 13% of the women with VCC had diabetes. Further results in the previous chapter showed that HIV/AIDS patients had lower prevalence of VVC (12.7%) a related study by [7] that was done to patients attending

SMIMER Medical College in Gujarati, India he noted that out of 122 respondents that had VVC 5.73% of them were infected with HIV/AIDS and this shows how having HIV can predispose you to VVC.

Discussions on behavioral Factors

In table 4.4, the use of the Inter Uterine Device registered only (6.3%) of positive cases among pregnant women while non-use participants reported a whopping 93.7% of positivity. Related to this study by [35] reported increased prevalence of VVC in yeast infection in women who ever used intra uterine devices. Equally, [9] registered a 13.3% of the women in south India who had VVC had a previous history of use of uterine devices. Further correlated results by [36]-[38], in Nepal revealed that 15% of the positive cases with VVC had a previous history of using uterine devices. Results from this study denoted that use of anti-biotics among pregnant women manifested positivity to VVC to the tune of (85.7%) while non-use only showed a meager (14.3%) positivity among the respondents. A connected study to the above findings showed that frequent antibiotic use was responsible for VVC among pregnant women.(Davidson n.d.) Likewise, Corticosteroid use was only reported among a few study participants with a smaller positivity rate to VVC (14.2%) although majority of the women who had VVC reported history of concurrent and frequent use of steroid [5]. Corticosteroids lowered the immune system of pregnant women hence more chances of VVC [31]. Also as presented by [5], majority of the women who had VVC reported history of concurrent and frequent use of steroids. As complimented in another related study, corticosteroids were stated to lower the immune system of pregnant women hence more chances of VVC [31].

CONCLUSION

The prevalence of VVC among pregnant women who attended Kamuli General Hospital was established as 42%, results showed that (84.1%) prevalence was registered among married pregnant women, education wise the highest prevalence of VVC was registered among those who had never gone to school with (58.7%), Catholics had the highest distribution of positivity of (31.7%), occupation with the highest positivity was those of housewives that exhibited (75%) positivity with VVC. Non-*Diabetic* pregnant mothers demonstrated the highest number of positive cases (73%) compared to those who had Diabetes *Mellitus* (27.5%). In the same way, HIV/AIDS patients had the lowest prevalence of VVC (12.7%) compared to the 87.3% who were negative, use of Oral contraceptives showed a lower prevalence or positivity rate to VVC compared to non-use 46% versus 54%, Inter Uterine Device registered only (6.3%) of positive cases among pregnant women while non-user participants reported a whopping 93.7% of positivity, further conclusions noted that use of anti-biotics among pregnant women manifested a positivity to VVC to the tune (85.7%) and finally non-users of Corticosteroid represented a positivity rate of 54(85.7%)

Recommendations

There is great need for health education to explain to the girls, issues concerning their health. This should be done at least twice in every term. The Hospital should also emphasize proper test and confirm the diagnoses of diseases before giving treatment. The Hospital should also emphasize on full treatment for the diagnosed cases. All females, irrespective of their age, tribe, marital status, religion, educational level and employment status, should be encouraged to make visits for prompt tests, diagnosis and treatment of VVC. Public forums should be used as a channel to promote good health habits. These include churches, community Sacco's and development groups. Staffs in the Ministry of Health in the department of public health who are concerned with reproductive health should be more aggressive in implementing existing policies.

Recommendations for Further Research

i. Research beyond descriptive study (qualitative) is needed, for example a research including teachers and the whole female staff and also

including many other schools should be done.

ii. A similar study may be done in a different geographical and cultural setting incorporating factors like pregnancy and effects of HIV and Diabetes that were not captured in this research.

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