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Research Article

Prevalence of Vaginal Candidiasis and Risk Factors: Case of Patients at the Efoulan District Hospital in Yaoundé, Cameroon

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Abstract

Objective: To identify the prevalence of vaginal candidiasis and associated risk factors among women attending the gynecology section of the Efoulan District Hospital in Yaoundé. **Patients and procedures:** In this cross-sectional study, 187 patients were enrolled. All cervico-vaginal samples were delivered to the hospital's microbiology lab where they were cultured on Sabouraud Chloramphenicol and Chromagar medium agar after the patients filled out a questionnaire requesting their socio-demographic information. **Results:** These were the findings: 51 women, or 27.27%, had vaginal candidiasis. With a prevalence of 70.59%, *Candida albicans* was the most prevalent species, followed by *Candida tropicalis* at 13.23%. The prevalence of vaginal candidiasis among women who attended prenatal clinics increased to 45.09%. Women in the West region of Cameroon suffered more from vaginal candidiasis (30/51), i.e., 58.82%, and the difference was significant compared with women in other regions of Cameroon. Women in couples were more exposed to vaginal candidiasis, with a total prevalence of 94.56% (48/51). Women at the university level and women in student occupations were more represented with regard to vaginal candidiasis; the respective prevalences were 64.70% (33/51) and 35.29% (18/51). **Conclusion:** *Candida albicans* remains the dominant species in vaginal candidiasis. Women attending antenatal clinics are more likely to suffer from vaginal candidiasis, underscoring the need to raise awareness and educate women about the prevention of genital infections.

Keywords: Vaginal candidiasis; Women; Genital infection; *Candida albicans*; Yaoundé

Introduction

A condition of the female genital tract known as vaginal candidiasis is brought on by yeasts of the Candida genus. One of the most common causes of gynecological consultations, it presents a treatment and recurrence challenge and has an impact on a woman's quality of life. Vaginal candidiasis, which is characterized by vaginal discharge and vulvovaginal irritation, often develops when the Candida fungus, which is naturally present in the body as a commensal, multiplies [1]. When vaginal mycosis is present, the leucorrhoea is white and lumpy, resembling curdled milk, and it is accompanied by burning and itching in the vulva as well as dyspareunia. Couples become tense as a result of all these symptoms, which also make women feel guilty since they can't enjoy pleasant sexual encounters [2]. According to Denning et al. (2018), vaginal candidiasis affects approximately 138 million women worldwide each year [3]. *Candida albicans* is the species most involved in vaginal candidiasis, with a frequency of 75%, in contrast to known non-albicans species [4]. It has been observed that most women suffer from vaginal candidiasis at some point in their lives, and almost 50% of them experience recurrence or several episodes [5]. In sub-Saharan Africa, the prevalence of vaginal candidiasis is estimated to be 33% [6]. This prevalence is increasing dramatically and is attributable to the multiplication of endogenous and exogenous risk factors that predispose women to acute vaginal candidiasis, including hormonal modulations associated with pregnancy, the luteal phase of the menstrual cycle, the use of oral contraceptives, hormone replacement therapy, and non-hormonal factors, such as prolonged antibiotic use and uncontrolled diabetes mellitus [7]. In Cameroon, a study conducted in 2016 showed a vaginal candidiasis prevalence of 11% [8]. Women's recurrent consultations for vaginal candidiasis constitute a public health problem in the community and show that its prevalence is still increasing. A pregnant woman with vulvovaginal candidiasis can infect her newborn at birth, causing respiratory tract infection (asphyxiating capillary bronchitis), endophthalmitis, and disseminated infection in the most severe cases, disseminated infection [9]. The aim of this study was to determine the prevalence of vaginal candidiasis and its risk factors among women attending the gynecology department of Efoulan District Hospital, Yaoundé.

Methodology

Type, period and study site

A prospective, cross-sectional study was conducted over a period of 5 months, from January 10 to May 15, 2021. It took place in the Gynecology Department of Efoulan District Hospital in Yaoundé.

Study Population

In total, 187 patients were recruited. Our sample size was calculated according to the Lorentz formula with a prevalence of 11.0% of vaginal candidiasis reported by the study conducted in Cameroon by Mogtomo et al. (2016) [8]. Patients excluded from the study were postmenopausal women, menstruating women, and women undergoing treatment with antibiotics, vaginal ova, or other azole derivatives for a fortnight. All women aged between 18 and 45 years who visited the Gynecology Department for prenatal consultation or for burning micturition, vaginal ulceration, vaginal pruritus, or pathological leucorrhea, and in whom a vaginal and cervical swab had been recommended were included in the study.

Method of Data Collection

After informing the women of the purpose of the study, an informed consent form was provided to each participant to read and sign. Sociodemographic data were recorded in a questionnaire and included age, occupation, level of education, clinical symptoms presented, marital status, and medication taken in the last two weeks.

Cervico-vaginal sampling

We cleaned the vaginal margins with Dakin's solution and performed vaginal swabs using a sterile speculum. Vaginal walls were scraped using a sterile swab. The samples were immediately sent to the microbiology laboratory of the hospital and processed. We performed a direct examination. Readings were taken with an X40 objective. Yeast and mycelial filaments were also examined.

Mycological Culture

Each vaginal sample was inoculated onto Chromagar Candida medium (Media Mage, Johannesburg, South Africa) and Sabouraud Chloramphenicol agar. This enabled us to isolate and identify various Candida species colonies according to the color obtained after 48 h of incubation on Chromagar agar. *Candida albicans* in this medium was green, *Candida tropicalis* was metallic blue, and *Candida krusei* was pale pink. Other Candida species were not identified because of the lack of reagents. A colony count of 10 or more in a cultured vaginal sample was considered pathological for the isolated yeast.

Ethical Considerations

Informed consent was obtained from each participant. Approval to conduct this research was obtained from the administrative management of the Efoulan District Hospital. Ethical clearance N. 2022/07/215/CNERSH/SP was obtained from the National Committee of Ethics in Human Health.

Statistical Analysis

Data were recorded and analyzed using the Epi Info 7.2 Software.

We used the chi-squared test to determine the relationships between vaginal candidiasis and the reasons for consultation and between vaginal candidiasis and the following risk factors: age, profession, region of origin, marital status, and level of education, with a significance level of $P<0.05$.

Results

Sociodemographic characteristics of the study population

In total, 187 patients met our eligibility criteria and were enrolled in the study. The average age of the population was 29 ± 1.38 years, with extremes of 18 and 45 years. The 25–31 years age group accounted for the majority (34.75%). Regarding sociodemographic characteristics, 60.96% (114/187) of the participants cohabited. Most women (46.53%, 87/187) had a university degree. The most common occupation was student (31.55%, 59/187). The majority of the women came from the central region of Cameroon (37.97%, 71/187). This study showed that 51 women (27.27 %) had vaginal candidiasis. The main species found were *Candida albicans* (36/51), with a prevalence of 70.59%, and Candida non-albicans (15/51), with a prevalence of 29.41%. Among the non-albicans Candida we had *Candida tropicalis* 13.23%, *Candida Krusei* 4.56%, and other unidentified Candida 11.62%. Of the women suffering from vaginal candidiasis, 45.09% had come for an antenatal consultation, and their prevalence was statistically higher than the 15.68% who complained of pelvialgia and pathological leucorrhea, and 11.76% who presented with pruritus (Table 1). In the study population, women from the western region of Cameroon suffered more from vaginal candidiasis (30/51; 58.82%), and the difference was significant compared with women from other regions of Cameroon (p=0.0000). The age group most exposed to vaginal candidiasis was 25-31 years (23/51; 45.09%). Cohabiting and married women suffered more from vaginal candidiasis, with a prevalence of 94.56 (48/51). Women at the university level and students were more likely to suffer from vaginal candidiasis, with prevalence rates of 64.70% (33/51) and 35.29% (18/51), respectively. Female students suffered more from vaginal candidiasis, and the difference from other professions was statistically significant (p=0.002) (Table 2).

Reasons for consultation	Vaginal candidiasis		Chi-square	Degree of freedom	P-value
	Yes n (51) (100%)	No n (136) (100%)			
Pre-natal consultation	23 (45. 09%)	26 (13. 90%)	16.64	5	0.005
Urinary burning	3 (5. 88%)	10 (7. 35 %)			
Vaginal ulceration	3 (5.88%)	5 (3.67%)			
Vaginal pruritus	6 (11. 76%)	13 (9. 55%)			
Pelvialgia	8 (15. 68%)	50 (36. 76%)			
Pathological leucorrhoea	8 (15. 68%)	32 (23. 52%)			

Table 1: Distribution of vaginal candidiasis according to reason for consultation.

Socio-demographic characteristics	CV /Yes n=51 (100%)	CV/No n=136 (100%)	Chi-squared	Degree of freedom	P-value
Regions			37.32	6	0
South	0	12 (8.82)			
Central	6 (11.76)	65 (47.79)			
West	30 (58.82)	26 (19.11)			
East	6 (11.76)	12 (8.82)			
Coast	2 (3.92)	4 (2.94)			
North	3 (5.88)	6 (4.41)			
Far North	4 (7.83)	11 (8.08)			

Age (years)					
[18-24]	12 (23.56)	48 (35.29)	3.99	3	0.2623
[25-31]	23 (45.09)	42 (30.88)			
[32-38]	10 (19.60)	26 (19.11)			
[39-45]	6 (11.76)	20 (14.70)			
Marital status					
Married	11 (21.56)	40 (29.41)	4.44	2	0.1084
Cohabiting	37 (72.54)	77 (56.61)			
Single/widowed/divorced	3 (5.88)	19 (13.97)			
Level of education					
Primary	0 (0)	16 (11.76)	12.43	2	0.002
Secondary	18 (35.29)	66 (48.52)			
University	33 (64.70)	54 (39.70)			
Profession					
Student	18 (35.29)	41 (30.14)	8.25	9	0.5093
Business	12 (23.52)	21 (15.44)			
Student	5 (9.80)	10 (7.35)			
Secretary	3 (5.88)	6 (4.41)			
Policeman	0 (0)	3 (2.20)			
Teacher	6 (11.76)	19 (13.97)			
Hairdresser	0 (0)	10 (7.35)			
Housekeeper	3 (5.88)	15 (11.02)			
Dressmaker	3 (5.88)	9 (6.61)			
Decorator	1 (1.96)	2 (1.47)			

Table 2: Distribution of vaginal candidiasis according to socio demographic characteristics.

Discussion

Prevalence of vaginal candidiasis in the study population

In our study, the prevalence of vaginal candidiasis was 27.27%, with *Candida albicans* (70.59%), Candida non-albicans (29.41%) comprising, *Candida tropicalis* (13.23%), *Candida Krusei* (4.56%), and other unidentified Candida species (11.62%). Our results are similar to those obtained by Seck et al. in 2015, who found a prevalence of 27.22%, with *Candida albicans* as the dominant species [10]. Our prevalence is higher than that obtained in the study by Martin Luther Mogtomo et al. (2016), who found a prevalence of 11.0% with 71.51% *Candida albicans* and 27.96% Candida non-albicans [8]. Another study by Sylla et al. (2017) in Senegal showed that the prevalence of vulvovaginal candidiasis was 32.6%, with the main species being *Candida albicans* (71.51%) and Candida non-albicans (27.96%) [11]. This variation in the prevalence of vaginal candidiasis could be explained by the immune status of the women, duration of the study, and study period (climate). The higher frequency of *Candida albicans* may be explained by its virulence due to an amplified adhesion factor, since it can exist in the form of a filament or pseudo-filament that can take root deep in the vaginal mucosa, making it more aggressive [12].

Reasons for consultation for vaginal candidiasis

In this study, the majority of women (45.09%) with candidiasis were asymptomatic as they came to the hospital for antenatal consultation; however, Aguin et al. (2015) revealed in her study that the most frequent symptoms observed in women suffering from vaginal candidiasis in accordance with the literature were profuse vaginal discharge and pruritus [13]. In our study, 11.76% of the women with vaginal candidiasis had pruritus. A study conducted by Mtibaa et al. (2017) on 2160 vaginal samples to test for vulvovaginal candidiasis reported that 72.25% of women presented with vulvovaginal pruritus as a symptom [14]. This higher prevalence of vaginal pruritus in their study may be justified by the larger sample size. According to Pizzorno et al. (2016), the main symptom of candidiasis is itching accompanied by a thick discharge that adheres to vaginal walls [15]. 15.68% of women in our study with vaginal candidiasis had symptoms of pathological leukorrhea and 5.88% had painful micturition. Indeed, vaginal candidiasis almost always manifests as curdled or clotted leukorrhea and sometimes dysuria. Ogouyemi et al. (2014) in their study found that 89.84% of women with vaginal candidiasis presented with leukorrhea [16]. The higher prevalence of vaginal discharge in their study compared to ours may be justified by their longer study duration and moreover all women were seen for consultation at the Gynaecological Obstetrics department for whatever reason, whereas our reasons for consultation in our study were well targeted.

Distribution of vaginal candidiasis according to socio-demographic characteristics

The results of our study showed that the prevalence of vaginal candidiasis was higher in the western region, with a prevalence of 58.82%. This high prevalence in the West region could be explained by the fact that in this region of Cameroon, society has remained very traditional and may have a specific culture with regard to cleanliness and health of the female genital tract, which is inculcated in adolescent girls. The prevalence of vaginal candidiasis in our study was lower in older women (11.76%) than in the younger population, and it was higher in the 18-24 age group (23.52%) and the 25-31 age group (45.09%). The high prevalence in these age groups may be justified by the fact that this age group is highly sexually active, which attacks the Döderlein flora that protects the vaginal cavity. Our results showed that vaginal candidiasis is very common in the young population. Similar results have been described by other authors, such as Anane et al. (2010) in Tunisia and Benchellal et al. (2011) in Morocco, who showed in their studies that the age group most affected was between 20 and 39 years and between 25 and 35 years, respectively [17,18]. This greater frequency of vaginal candidiasis in the younger population could also be explained by the presence of estrogenic hormonal activity and/or the use of contraceptive pills containing hormones that reduce vaginal defence mechanisms [16]. The high prevalence of vaginal candidiasis in couples (cohabiting and married) could be linked to the fact that this population has frequent sexual relations, which would destroy the Doderlein flora and therefore expose them to genital infections. We could also consider the possibility of transmission of Candida by sexual means, as couples are formed and have a stable relationship [16].

The results of our study showed that depending on the level of education and occupation, the prevalence of vaginal candidiasis was higher in women who were students (35.29%) and university graduates (64.70%). In contrast, Ghaddar et al. (2019) reported that women with a low level of education (primary) had the highest frequency of candidal vaginosis [19]. This high prevalence of vaginal candidiasis could be explained by the fact that university students are poorly informed through social networks about the hygiene of their vaginal cavity and are often adept at intravaginal practices [20].

Conclusion

Candida albicans remains the dominant species in vaginal candidiasis. Women with a university education and from the western region of Cameroon were more likely to be exposed to vaginal candidiasis. The statistically significant relationship between vaginal candidiasis and the different risk factors of education level and region of origin highlights the need to raise awareness and educate women about the prevention of genital infections.

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