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Vaginal Candidiasis in Women of Childbearing Age at the University Hospital of Brazzaville: Prevalence and Associated Factors

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ABSTRACT

Introduction: *Vaginal candidiasis is a fungal disease caused by a yeast type Candida. It affects more than 75% of women during the period of genital activity. Changes in vaginal pH due to various factors lead to the onset of the infection.*

Objective: *Determine the prevalence of vaginal candidiasis in women of childbearing age and look for associated factors or risk for its occurrence.*

Patients, Materials and Method: *We conducted a cross-sectional analytical study from July to October 2019. It concerned all patients aged 15 to 49 years, received at the Parasitology-mycology and parasitic immunology laboratory of the University Hospital of Brazzaville for an analysis of the vaginal sample. For each vaginal sample, a direct examination and culture on Sabouraud Chloramphenicol medium with and without Actidione were performed. A questionnaire was completed specifying age, medical and surgical history, symptoms and risk factors. Statistical analysis was performed by SPSS 20 using Chi-square test and Student's test and multivariate logistic regression was performed. The test was significant when $p < 0.05$.*

Results : *Among 152 samples analyzed, 88 were positive on direct examination (48.7%) and 34 were positive after culture (22.4%). It concerned patients of mean age 32 years (24 years, 40 years), living with one sexual partner (79.4%), never had abortions (64.7%). We found the use of antibiotics (2.9%), corticosteroid therapy (5.9%) and diabetes (6.6%). Among the women included in the study, 32.4% were pregnant. 38.2% of patients used intimate bath and 14.7% used community bath towels; 23.5% wore synthetic underwear; 26.5% of tight clothing and 26.4% had wrong cleaning mode after defecation ($p = 0.003$). Symptoms associated with vaginal candidiasis were significantly leucorrhoea (38.2%; $p = 0.000$), burning sensation (22.4%; $p = 0.003$) and vulvar pruritus (35.5%; $p = 0.016$). The risk factors associated with the occurrence of vaginal candidiasis were the presence of leucorrhoea and the wrong cleaning mode after defecation associating both front to back / back to front. Patients with leucorrhoea had a 4.21 folds higher risk of vaginal candidiasis, while those with wrong cleaning mode front-to-back / back-to-front had a 28.97 folds higher risk.*

Conclusion: *Vaginal candidiasis is common in women of childbearing age with poor hygienic conditions. The associated factors identified are those found in the literature, among which, leucorrhoea and cleaning mode combined from front to back / back to front.*

Keywords
Vaginal candidiasis, Risk factors, CHU, Brazzaville.

Introduction
Vaginal candidiasis is a yeast infection caused by the presence of a fungus, *Candida* [1-3]. It is the most common genital infection in women and affects nearly 75% of sexually active women, especially pregnant women [4-7]. *Candida* are yeasts, endogenous or exogenous microorganisms, which pathogenicity is expressed only in the presence of local or general promoting factors. The mere presence of these yeasts is not synonymous with disease, as the isolate responsible for the infection is most often is hosted by the patient in the commensal state. Saprophytic of the digestive tract, the fungus can become pathogenic by the conjunction of certain factors. These factors may be an increase of estrogens secondary to either oral contraception or pregnancy; the presence of poor controlled diabetes, which facilitates adhesion of *Candida* to epithelial cells; use of local or systemic broad-spectrum antibiotics; the existence of HIV / AIDS infection. Other factors, such as genetic factors (race, blood type), factors linked to women's behavior (clothing hygiene, intimate hygiene, frequency of some sexual practices), mechanical contraception (intrauterine device, vaginal ring) [4,8]. Considering these different risk factors for vaginal candidiasis (VC), our objective in this work was to determine the prevalence of vaginal candidiasis in women of childbearing age at the Brazzaville University Hospital and to identify associated factors. As specific objectives, this work aimed to describe the epidemiological and Para clinical aspects of the patients included in the study.

Patients, Materials and Method
This was a cross-sectional analytical study conducted from July 15 to October 31, 2019 in the Parasitology-Mycology laboratory of the University Hospital of Brazzaville. All the patients who came to the collection room during the study period to perform vaginal sample analysis were included after completing a consent form. Data related to socio-demographic variables (age, profession, level of education), medical and gynecological history, symptoms and mycological analysis were collected from a survey sheet.

With each sample, collected vaginal pH measurement was performed using a color strip, a macroscopic examination to appreciate the aspect of leucorrhoea and the vaginal mucosa. A direct microscopic examination for yeasts and a culture on Sabouraud chloramphenicol medium were performed. The culture media were incubated at 37°C in an aerobic atmosphere for 24 hours.

Collected data were analyzed using the Epi-info 7.2.2.6 software. Calculations were performed by frequencies for qualitative data and central tendency and dispersion parameters for quantitative variables. The test was significant when the p was less than 0.05. Logistic regression was performed to determine the factors associated with the onset of vaginal candidiasis.

Results
Among one hundred and fifty-two samples collected, 88 were positive on direct examination (48.7%) and 34 were positive after culture (22.4%). It concerned patients with a median age of 32 years (24 years, 40 years), with a single sexual partner (n = 27; 79.4%), multiple (n = 1; 2.9%), virgins (n = 31; 91.2%) and never had an abortion (n = 22; 64.7%). The gyneco-obstetrical characteristics are represented in Table 1. Use of antibiotics was found (2, 9%), corticosteroid therapy (5.9%) and diabetes (6.6%). Pregnancy was found in 32.4% of women included in the study. The main symptoms leading to the examinations were vulvar pruritus (n = 18; 52.9%), leucorrhoea (n = 22; 64.1%), urination burns (n = 14; 41.2%) and dyspareunia (n = 8; 23.5%). The realization of

Table 1: Gyneco-obstetrical characteristics of patients with vaginal candidiasis.

Variables	Vaginal Candidiasis				Total N=152	p
	Yes		No			
	N=34	%	N=118	%		
Virginity						0,065
Yes	3	8,8	2	1,7	5	
No	31	91,2	116	98,3	147	
Partners						0,102
One	27	79,4	109	0,9	136	
Multiple	1	2,9	1	6,8	2	
Without	6	17,7	8	92,4	14	
Abortion						
Yes	12	35,3	57	48,3	69	0,179
No	22	64,7	61	51,69	83	
Gynecological diseases						
Yes	2	5,9	13	11,0	15	0,384
No	32	94,1	105	89,0	137	
Pregnancy						0,294
Yes	11	32,4	50	42,4	61	
No	23	67,6	68	57,6	91	
Treated for candidiasis						0,151
Yes	7	20,6	13	11,0		

Table 2: Risk factors associated with vaginal candidiasis.

Variables	Vaginal candidiasis				OR (IC95%)	p
	Yes		No			
	N=34	%	N=118	%		
Occupation						
With	16	47,1	71	60,2	1,72 (0,45-6,56)	0,429
Without	18	52,9	47	39,8	Ref.	
Marital status						
Married	15	44,1	33	28,0	1,27 (0,37-4,36)	0,703
Single	19	55,9	85	72,0	Ref.	
Use of antibiotics						
Yes	1	2,9	19	16,1	-	1,000
No	33	97,1	99	83,9		
Virginity						
Yes	3	8,8	2	1,7	8,50 (0,33-218,90)	0,196
No	31	91,2	116	98,3	Ref.	
Abortion						
Yes	12	35,3	57	48,3	0,47 (0,14-1,57)	0,221
No	22	64,7	61	51,69	Ref.	
Treated for candidiasis						
Yes	7	20,6	13	11,0	2,60 (0,48-14,11)	0,268
No	27	79,4	105	89,0	Ref.	
Tight clothing						
Yes	9	26,5	53	44,9	0,62 (0,15-2,46)	0,494
No	25	73,5	65	55,1	Ref.	
Cleaning method						
Front to back	25	73,5	102	86,4	1,71 (0,22-12,83)	0,598
Both	7	20,6	3	2,6	28,97 (1,81-462,55)	0,017
Back to front	2	5,9	13	11,0	Ref.	
Vulvar pruritus						
Yes	18	52,9	36	30,5	1,96 (0,54-7,10)	0,307
No	16	47,1	82	69,5	Ref.	
Leucorrhoea						
Yes	22	64,7	36	30,5	4,21 (1,16-15,33)	0,029
No	12	35,3	82	69,5	Ref.	
Burning sensations						
Yes	14	41,2	20	83,1	2,25(0,52-9,76)	0,279
No	20	58,8	98	16,9	Ref.	

intimate bath was practiced by 38.2% of patients and 14.7% used community bath towels; 23.5% wore synthetic underwear; 26.5% of tight clothing and 26.4% had a wrong method of cleansing after defecation. Symptoms associated with vaginal candidiasis were significantly leucorrhoea (p = 0.000), burning sensation (p = 0.003) and vulvar pruritus (p = 0.016). The risk factors associated with the occurrence of vaginal candidiasis were the presence of leucorrhoea and the method of cleansing after defecation combining both front to back / back to front (p = 0.003). However, corticosteroid therapy or antibiotics did not influence the occurrence of vaginal candidiasis in patients (Table 2). Patients with leucorrhoea had a 4.21 folds higher risk of vaginal candidiasis, while those with a wrong cleansing mode combined front-to-back / back-to-front had a 28.97 folds higher risk.

Discussion

Vulvovaginal candidiasis is one of the most frequent gynecological infections in women during the period of genital activity, i.e. in women of childbearing age [8]. These hormone-dependent candidiasis, occur in the second part of the menstrual cycle and during pregnancy, particularly in the third trimester, justifying its frequency in young women. The prevalence of this condition decreases after menopause as reported in the literature. Use of broad-spectrum antibiotics and poor controlled diabetes were reported to be contributing factors of vaginal candidiasis. In our study, use of antibiotics and diabetes is found in significant proportions, which corroborates the data as reported by in. The major symptoms of vaginal candidiasis are vulvar pruritus and burning sensations, while leucorrhoea typically presented like "curdled milk" are in variable abundance. These symptoms were found in the present study and 23.5% of patients reported dyspareunia. The occurrence of vaginal candidiasis is multifactorial. Hormonal, metabolic, immune, genetic and behavioral predisposing factors are implicated [8]. These factors are reported in variable proportions in different populations [9-12]. Thus, in our study, we noted factors related to personal hygiene and clinical signs. Leucorrhoea

are reported as risk factor in women with vaginal candidiasis. In several studies, leucorrhoea has been pinpointed as being one of the cardinal clinical signs of vaginal candidiasis, whether in infections caused by *Candida albicans* or *Candida non-albicans* [2,13]. But few authors have shown that they are a risk factor for the occurrence of VC. As reported by Konaté et al. in Abidjan who did not find leucorrhoea as risk factors for the occurrence of vaginal candidiasis [5]. In the other hand, Ane-Anyangwe et al. [14] had shown that clinical signs were not a risk factor for the occurrence of vaginal candidiasis. However, considering leucorrhoea as a risk factor, our study indicates that, in our environment, the presence of leucorrhoea in case of lower genital infection should suggest candidiasis. However, this suggestion should be evaluated in larger scale assessing this sign in vaginal candidiasis and genital infections, because this attitude may be the source of probabilistic prescription, which is currently prohibited because of the emergence of antimicrobial resistance.

The gut flora contains yeasts. These yeasts can be found in the vagina not only with certain sexual practices [4,8] but also by the woman's cleaning method (hygiene habits) while in toilets. Because fecal germs can be found in the vagina or urine when fecal hygiene is poor. Thus, cleansing after defecation has been pinpointed in the population of women consulting our laboratory as a risk factor for the occurrence of vaginal candidiasis. This habit is not reported in the literature to be a risk factor. Zeng et al. in China [15] appreciated the front-to-back and back-to-front cleaning method and showed that cleaning was not a risk factor, without assessment of the combined cleaning mode front to back with back to front as reported in our study. However, Guzel et al. in Turkey reported that patients with a short anovaginal distance had more vaginal candidiasis than others [16].

Direct microscopic examination allows rapid orientation of the diagnosis; yeasts appearing in rounded or oval form, possibly budding. We found these yeasts in almost half of the women on direct examination. The presence of filaments suggests species capable of filamentation such as *C. albicans* and thus eliminates *C. glabrata*. In less than 20% of cases, the yeasts were isolated after culture in our study. Elsewhere, several authors have isolated yeasts from *Candida* after cultivation only in the fresh state [2,3,6]. Yeasts of the *Candida* genus grow in many media not always available in our context of countries with limited resources with a deficient technical platform. It should also be noted that the identification of yeasts is performed using phenotypic criteria, such as the formation of a pseudo mycelium on poor medium, of chlamydospores, and the assimilation or fermentation of some sugars using galleries and that there are chromogenic media allowing discrimination of species according to their color and detecting possible associations. The difficulties in obtaining these media partly explain the low rate of isolation of yeasts in culture.

Conclusion

There are many risk factors for the occurrence of vaginal candidiasis. They may vary depending on the studied population. Factors associated with the occurrence of vaginal candidiasis in our context were the presence of leucorrhoea and the combined front-to-back/back-to-front cleaning method.

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