

Prevalence of vaginal infection in 15 to 24 years women in Ouagadougou, Burkina Faso

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ARTICLE INFO

Article history:

Received on: 20/07/2016

Revised on: 23/09/2016

Accepted on: 05/10/2016

Available online: 31/01/2017

Key words:

Vaginal infection, microorganism, antibiotic, antifungal, Burkina Faso.

ABSTRACT

The aim of this study was to determine the prevalence of vaginal infection among young 15 to 24 years women in Ouagadougou. This prospective study carried out from April 2010 to February 2011 and concerned 118 women coming to medical care at Medical Center Saint Camille of Ouagadougou and the national student assistance office of Ouagadougou for gynecological consultation. Microscopic observations and culture on specific media of women's vaginal discharge were used to identify the incriminated microorganism. The sociodemographical data gathered using a semi structured questionnaire revealed that a proportion of 32.2% of women had non-protected sexual intercourses and 34.75% used condom as a mean of protection. An abnormal vaginal discharge was noticed among 87.29% of women (103 women) and 74% of them had a vaginal infection. This vaginal infection was due to *Candida albicans* (48%), *Gardnerella vaginalis* (2.13%) and other endogenous bacteria (28%). Twenty four (24%) presented a coinfection involving *Candida albicans*. The antifungal and antibiotics drugs frequently used to cure vaginal infection were efficient excepted miconazol (18.18% of resistance) for the treatment of vaginal candidiasis, ampicillin (73.78% of resistance) and cotrimoxazole (43.64% of resistance) for the treatment of vaginal infection involving bacteria.

INTRODUCTION

UNAIDS in its fact sheet on global statistics in 2014 estimated that 39.6 million people were living with HIV worldwide. In Sub-Saharan Africa, 25.8 million people are infected and women represent more than the half of people living with HIV. According to recent the reports of UNAIDS, 66% of new global infections happen in sub-Saharan Africa (UNAIDS, 2014). HIV belongs to the huge panel of sexually transmitted pathogens, the most famous being *Neisseria gonorrhoeae*, *Chlamydia trachomatis*, *Treponema palidum*, herpes simplex virus type 2, Human Papillomavirus, Hepatitis B, *Trichomonas vaginalis* and *Candida albicans*. These sexually transmitted infections can also be transmitted from mother to child during pregnancy and childbirth by blood products, transplantation, graft

and transfer or occasionally by other non-sexual ways (WHO 2007). Endogenous infections of the reproductive tract (RTI), including bacterial vaginosis and candidiasis, result from alterations in the balance of the normal protective bacterial flora of the female reproductive system. This flora consists mainly of *Lactobacillus* bacteria that produce hydrogen peroxide (H₂O₂), an antiseptic that is associated with myeloperoxidase and hydrochloric acid mucus to form highly toxic to pathogens (Hainer *et al.*, 2001; Mitchell, 2004; Spencer *et al.*, 2007). In Burkina Faso, the combined efforts of government and its partners have achieved today a prevalence rate of 0.9% for HIV/AIDS (GARP Report 2014). The age range of 15-24 years is the most affected by this epidemic with a prevalence of 0.8% (GARP Report 2014). In adolescents, the health situation is influenced by early pregnancies, illegal abortions, early sex and unprotected, multi-partnership resulting in a high prevalence of HIV and STIs. The phenomenon is exacerbated by the low use of contraceptives and health services by young people.

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The lack of reproductive health service offering tailored to adolescents contributes greatly to the precarious situation of the 15-24 age health (National Health Development Plan 2010-2020). The reduction of the prevalence of sexually transmitted infections and reproductive tract infections in the young women could improve women's health and reduce the risk of acquiring HIV. Thus, the main objective of this study was to determine the prevalence of vaginal infections in women between 15 to 24 years in Ouagadougou, Burkina Faso.

MATERIALS AND METHODS

Type and study site

This is a descriptive and analytical study of the prevalence of vaginal infections conducted on young women of 15 to 24 years from April 2010 to February 2011 in Ouagadougou. The young women were recruited when visiting obstetrical service at the Medical Center Saint Camille of Ouagadougou and the national student assistance office for gynecological pains. Each patient sign a consent form to materialize her agreement to participate to the study. After the recruitment process, the nurse/midwife completed a baseline standardized questioner containing information about age, marital status, schooling, sexual activity and practices, first sex age, number of sexual partners, modern contraceptive use and HIV test screening. Information regarding the current vaginal problem and its history, a previous medical visit for the same problem was also collected on the questioner.

Then a physical and obstetrical examination is made by the nurse/midwife or the physician. After examination, the young woman is directed to the laboratory of the Medical Center Saint Camille of Ouagadougou for vaginal sample collection..

Microbial isolation and identification

All the participants were subjected to vaginal swabs in the laboratory of Saint Camille Medical Center in Ouagadougou. The microbial isolation and identification were performed on the collected samples at the Saint Camille Medical Centre using the conventional methods in vigor in the Centre. In brief the process included microscopic examination and the growth on selective culture media. Indeed, *Gardnerella vaginalis* was identified on the basis of the Amsel criteria including, acid pH > 4.5 of the vaginal discharge, the fishy odor of rotten clearance by the sniff test and the microscopic observation of "Clue cells". The other pathogenic bacteria were grown on chocolate agar+Polivitex, the confirmation of the identities was made with the Biomerieux API systems. Fungal strains were grown Sabouraud+Chloramphenicol. Antimicrobial susceptibility tests were performed as recommended by the French Society for Microbiology.

Ethical issue

This study received the approval from the Ethics Committee of the Saint Camille Medical Center and all participants signed an informed consent form.

RESULTS

Sociodemographic characteristics of young women

A total of 118 young women aged 15-24 years, mean age 21.8 ± 2.01 , living in Ouagadougou were included in the study. The socio demographic data gathered are displayed in table 1. According to the data in the table, the majority of them (58.47%) were single; however all of them were sexually active. The half had their first sex between 17 and 19 years, while 32% had their first sex after 20 years, the rest (11.02%) went to their first sex before 17 years. For the periodicity, 50.85% of the surveyed women regularly go to sexual intercourses, while this is occasional for 47.46% of them. The majority had a fix partner, thus less than 2% asserted to have sexual intercourses with multiple partners. The contraception was used by approximately 40% of the surveyed, mainly the condoms. All the surveyed encountered at least once a vaginal problem, however only 54.24% of them had a previous gynecological consultation. Considering the HIV, the majority (63.56%) knew their HIV serostatus.

Table 1: Sociodemographic characteristic and information on the participant sexual activity.

		N(%)
Age	15-20 years	31 (26.27)
	21-24 years	87 (73.73)
Marital status	Single	69 (58.47)
	Married	49 (41.53)
Sexual activity	Yes	118 (100.00)
First sex age	12-16 years	13 (11.02)
	17-19 years	59 (50.00)
	20 years and above	38 (32.20)
	Not informed	8 (6.78)
Periodicity of sexual intercourse	Occasional	56 (47.46)
	Regular	60 (50.85)
	Not informed	2 (1.69)
Number of sexual partner	One fixe Partner	96 (81.36)
	Multiple Partner	2 (1.69)
	Not informed	20 (16.95)
Modern contraception	None	38 (32.20)
	Pills	6 (5.08)
	Condom	41 (34.75)
	Other methods	9 (7.63)
	Not informed	24 (20.34)
Vaginal problem lasting	One week	31 (26.27)
	One month	17 (14.41)
	Two months	70 (59.32)
Previous medical visit for the same problem	Yes	64 (54.24)
	No	6 (5.08)
	Not informed	48 (40.68)
HIV testing	No	6 (5.08)
	Not informed	48 (40.68)
	Yes	75 (63.56)
	No	43(36.44)

Vaginal infection

The gynecological examination revealed that 87.29% of the women had an abnormal flora with more or less leucorrhoea and for 73.73% of them the leucorrhoea exceeded one month. The main cause of the gynecologic problem was a vaginal infection in 73.56% cases. Thus the microorganisms growth and identification was attempted for 64% samples (Figure 1). No *Trichomonas vaginalis* was found on the smears. Samples culture revealed the

presence of several microorganisms, the most frequently isolated being *Candida albicans*, *Staphylococcus* spp. and Enterobacteria. The microbial distribution is presented in figure 2.

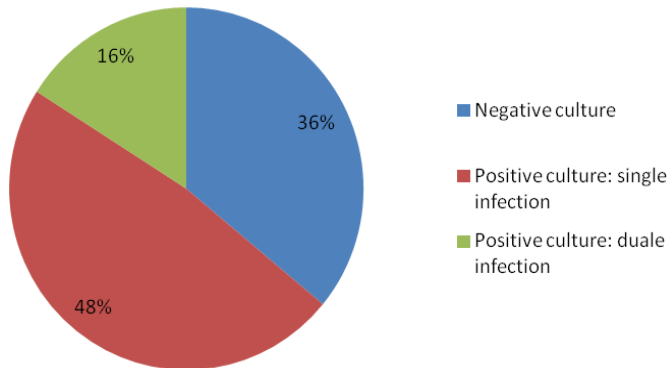


Fig. 1: Proportion of infected vaginal swabs.

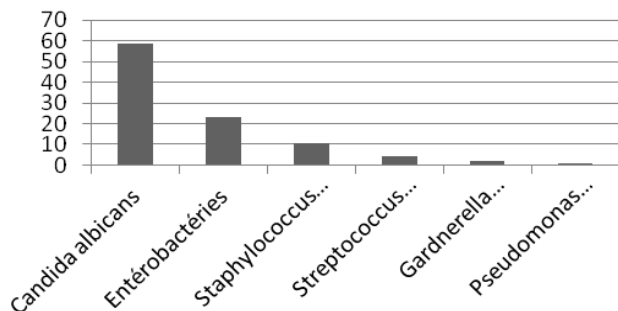


Fig. 2: Distribution of isolated pathogens from vaginal samples antifungal.

Antimicrobial and antifungal susceptibility testing

The susceptibility test revealed that all the isolated microorganisms resisted at least to one antibiotic or antifungal. Thus, the strains of *Candida albicans* were resistant to the following antifungals in the following rates miconazol (18.18%), nystatin (5.45%), econazol (1.82%) and clotrimazol (1.82%).

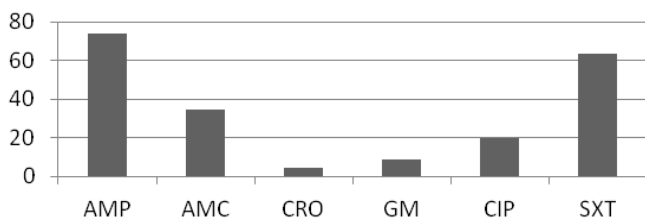


Fig. 3: Resistance to antibiotics AMP: ampicillin, AMC: amoxicillin + clavulanic acid, CRO: ceftriaxone, GM: gentamicin, CIP: ciprofloxacin, SXT: cotrimoxazole).

Figure 3 displays the antibiotic resistance pattern of the isolated bacterial strains. The tested antibiotics were beta-lactam antibiotics (ampicillin, amoxicillin + clavulanic acid, ceftriaxone), aminoglycosides (gentamicin), fluoroquinolones (ciprofloxacin) and cotrimoxazole. Ampicillin and cotrimoxazole were found to be less active with resistance rates of respectively 73.68% and 63.64%; ceftriaxone remained the most efficient antibiotic with resistance rate of 4.35%.

DISCUSSION

The present study aimed to investigate the main microorganisms implicated in vaginal infections in Ouagadougou. All the surveyed women were sexually active, and half of them had their first intercourses between 17 and 19 years. This reflects the reality of Burkina Faso because according the several surveys conducted in the country, the main age for the first sexual intercourses for girls is around 17 years (EDSBF-MICS IV, 2010). This trend is similar to the report of Stephenson *et al.* (2014) on the first sexual intercourse in African countries namely Burkina Faso, Ghana, Malawi and Uganda. The early sexual activity could be explained by the non-parent communication with their children about reproductive health in general (Somé *et al.*, 2012) and also the influence of media, precarious family life conditions, strong presence of the opposite sex friends, proximity adolescents married or cohabiting (Stephenson *et al.*, 2014). Among young women in this study, 32.2% did not use any means of protection during sex. The male condom is the main contraceptive method used, while the hormonal contraception is not widely used in this age group. These results are comparable to those of Bankole *et al.*, (2014) who found that 32% of adolescents have unprotected sex. Failure in protection during sex remains a reality for these girls resulting in increasing the risk of sexually transmitted infections and unwanted pregnancy. Interestingly, the majority of the included subjects had HIV screening test, confirming knowledge of this infection. Among the women 15 to 49 years in Burkina Faso, the rate of use of modern contraception has remained stable from 2003 to 2010 (Hounton *et al.*, 2015). The early sexual activity coupled with non-use of protective means during the sex makes girls more vulnerable to STIs and HIV/AIDS. Although HIV prevalence in this age group has declined over the years; it would be wise to continue prevention to avoid the risk of resurgence. The vaginal discharge is a common phenomenon among women in sexual activity and more often the result of an imbalance of vaginal flora by progressive disappearance of *Lactobacillus*. This imbalance can be due to infections, hormonal disturbances or other factors. All young women included in the study had a gynecological problem that required medical examination. About 87% of them had an abnormal flora with more or less abundant presence of vaginal discharge and for almost 75% of them, the duration of vaginal exceed one month. Theses findings are in accordance with previous studies conducted in Ouagadougou showing high prevalence of vaginal infections and low prevalence of co-infections in women with vaginal discharge (Karou *et al.*, 2012; Sanou *et al.*, 2014). As these previous reports, no *Trichomonas vaginalis* infection was detected in this study, although in South Africa, the prevalence of *Trichomonas vaginalis* infection was 6% in girls of 17-21 years, (Puran *et al.*, 2014). The infection with *Trichomonas vaginalis* is a risk factor for acquiring HIV/AIDS (Moodley *et al.*, 2002), thus the low proportion encountered in the present study is an encouraging result in the fight against HIV/AIDS in Burkina Faso. *Candida albicans* was the main pathogen causing gynecological problems in this study

corroborating the results of Karou *et al.* (2012). By cons, the found prevalence seemed to be higher than that of Sanou *et al.* (2014). Other African countries also showed a low prevalence of vaginal *Candida albicans* infection, particularly in South Africa with a prevalence of 10% among 17-21 years (Puran *et al.*, 2014) and Ethiopia with 3.2% in women under age 20 and 7.3% among women 20 to 29 years (Mulu *et al.*, 2015). The prevalence of bacterial vaginosis with *Gardnerella vaginalis* was very low, as in the report of Karou *et al.* (2012). These trends are comparable to those of Mulu in Ethiopia who had found a prevalence of 3.2% among women under age 20 and 2.3% for those with an age between 20 and 29 years. However in South Africa, the prevalence of bacterial vaginosis in women aged 17 to 21 was 50%. The imbalance of the vaginal bacterial flora can also cause the development of commensal bacteria that are enterobacteria, mainly *E. coli*, *staphylococci* and *Streptococcus agalactiae*. These commensal bacteria are the main responsible for early neonatal infections when the newborn is infected while passing through the vaginal tract colonized by these bacteria (Camacho-Gonzalez *et al.*. 2013). Their control during pregnancy especially during the third trimester of pregnancy may contribute to the fight against early neonatal infections. The resistances to antibiotics and antifungals are a public health problem and a threat to the population and should be better monitored to better control strategy. In our study, 64 young women had suffered a medical consultation for vaginal and 78.13% of them received treatment through the empirical therapy using a simplified algorithm diagnosis and treatment of vaginal infections introduced by the health authorities of Burkina Faso in 1996. In addition, among these young women who previously consulted, 71.86% of them said that the treatment was ineffective. This inefficiency could be explained by the failure to eliminate the responsible pathogens. This causes the development of resistance phenomena to antibiotics and antifungals that may be encountered. In this study, clotrimazole and econazole have proven very effective against *Candida albicans* strains isolated, on the other hand, miconazole exhibits fair resistance. Our results corroborate those of Sanou *et al.* who found resistance prevalences of 23.1% for miconazole, nystatin 6% and 0% for fluconazole (Sanou *et al.*. 2014). These results show a decrease in the effectiveness of miconazole for the treatment of vaginal candidiasis, therefore a surveillance should be enhanced to address the problem of antimicrobial resistance. Bacteria isolated were mostly resistant to ampicillin and cotrimoxazole. Resistance to penicillins and cotrimoxazole are very common as more and more isolated bacteria produce beta-lactamases that inactivate beta-lactam antibiotics (Weiner *et al.* 1999).

CONCLUSION

The imbalance in the vaginal flora by progressive disappearance of *Lactobacillus* due to sexually transmitted infections increases the vulnerability of women to HIV/AIDS infection. *Candida albicans* and other bacteria are the main cause

of gynecological problems encountered in women aged 15 to 24 in Ouagadougou, manifesting most often by an imbalance of vaginal flora that are recurring. Antifungal agents commonly used are still very effective against *Candida albicans* except miconazole. The colonization of the vaginal tract by *E. coli*, *Staphylococcus aureus* and *Streptococcus agalactiae* should be better monitored during pregnancy to prevent early neonatal infection.

ACKNOWLEDGEMENT

We are thankful to all the departmental technical staff of the national student assistance office in Ouagadougou and Saint Camille Medical Center, Ouagadougou. We are grateful to all the participant women for their kind cooperation.

Financial support and sponsorship: The study was supported by the government of Burkina Faso through the project on multisectorial national plan of HIV/AIDS (PA-PNM) and the national student assistance office.

Conflict of Interests: There are no conflicts of interest.

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How to cite this article:

Nadembega CW, Djigma F, Ouermi D, Karou SD, Simpore J. Prevalence of vaginal infection in 15 to 24 years women in Ouagadougou, Burkina Faso. *J App Pharm Sci*, 2017; 7 (01): 209-213.