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RISK FACTORS OF VULVOVAGINAL CANDIDIASIS IN DERMATO-VENEREOLOGY OUTPATIENTS CLINIC OF SOETOMO GENERAL HOSPITAL, SURABAYA, INDONESIA

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Abstract

Background: Vulvovaginal Candidiasis (VVC) is one-third of vaginitis case. About 75% of women will have at least one episode of VVC. Complication of VVC can be unfavorable to impact the patient's quality of life. Knowing its risk factors can prevent someone suffering from pathological VVC and its sequelae. The purpose of this study was to identify risk factors of VVC.
Materials and Methods: A descriptive retrospective study was conducted by total sampling to 213 medical records of VVC patients from 869 fluor albus patients in Sexually Transmitted Infection (STI) Division, Dermatology and Venereology Outpatient Clinic in Dr. Soetomo General Hospital, Surabaya, East-Java, Indonesia in 2011 to 2013.
Results: In 2011, 69 cases (22.77%) from 303 fluor albus patients, in 2012 69 cases (22.69%) from 304 fluor albus patients, and in 2013 75 cases (28.63%) from 262 fluor albus patients. As many as 180 (84.50%) of the patients were sexually active age group, which was 15-44 years old. Mostly patients were married (69.48%). As many as 167 (78.40%) sexual partners were patient's husband. About 95 (44.13%) patients presented with recurrent VVC. Risk factors are previous STIs 74 (34.74%), vaginal *douching* (27.70%), pre-martial sexual intercourse (5.63%), other STIs (3.29%), diabetes mellitus (2.34%), gestation (1.88%), other *fluor albus* infections (0.94%), *pantyliner* (0.47%), and STIs in sexual partner (0,47%).
Conclusion: Avoiding and/or managing risk factors is important to prevent VVC and its complications.

Keywords: *Candidasis vulvovaginalis, Risk factors*, Sexually transmitted infection

Introduction

Vulvovaginal Candidiasis (VVC) is yeast infection in vulva and/or intravaginal that caused by *Candida spp.* About 75% of woman will have at least one episode of VVC, from that abour 40%-45% will have two or more episodes, and approximately 10%-20% of women will have complicated VVC (Workowski, Bolan, 2015). The clinical manifestation of VVC are minimally vaginal discharge, serous-mucous, homogen, look a like cottage cheese, and minimally odor. The symptoms are pruritus, pain, irritation, burning sensation, dyspareunia, and dysuria (Sobel, 2008).

About 85%-95% yeast strain in vaginal discharge is *Candida albicans* (Erdem et al, 2003; Holland et al, 2003). Other species that cause VVC are non-*albicans* species, about 10-20% *Candida glabrata* affects women. The transmission, spreading of disease, and asymptomatic colonization usually caused by Yeast blastospores (blastoconidia) form of *Candida* sp. On the other side, in symptomatic vaginitis most commonly found are germinated yeast that produce mycelia (hyphae).

The risk factor of VVC are pregnancy, contraceptives, diabetes mellitus, use of antibiotics, behavioral factors. In pregnancy, high level of reproductive hormones provides a glycogen, an excellent carbon source, for *Candida* organisms (McCourtie, Douglas, 1981). Contraceptives method that trigger *Candida* infection are in IUD users (Parewijck et al, 1988; Spellacy et al, 1971), diaphragm, and condom users, with or without spermicide (Barbone et al, 1990; Peddie et al, 1984; Hooton et al, 1994). Diabetes mellitus patient usually undergo high sugar plasma level and high sugar diet may contribute to risk of VVC (Donders et al, 2002). Antibiotics play role in exacerbating normal vaginal flora can lead to *Candida* overgrowth in gastrointestinal tract, vagina, or both (Oriel, Waterworth, 1975). The

behavioral factor that predispose increasing the incidence of VVC are sexual activity, clothing and cotton underwear, chemical contact, local allergy, hypersensitivity reaction (Sobel, 2008).

Diagnosis of VVC are from history taking, physical examination (Linhares et al, 2001; Bergman et al, 1984), and some additional examinations. From history taking, pruritus is the most typical symptoms of VVC (Bergman et al, 1984). From the appearance of vaginal discharge usually minimal, serous-mucous in consistency, homogeny, cottage cheese like, with minimal odor (Sobel, 2008). Culture (Schaaf et al, 1990), and wet mount or saline preparation for microscopic examination of vaginal can support the diagnosis of VVC.

Complicated VVC are recurrent VVC, severe VVC, and Nonalbicans VVC. Definition of VVC recurrent is defined if a woman has four or more episodes of symptomatic VVC in a year. Severe VVC including extensive vulvar erythema, edema, excoriation, and fissure formation usually due to some woman has lower therapeutic response (Workowski, Bolan, 2015).

This study was performed to know the risk factors of VVC can prevent someone suffering from pathological VVC and its sequelaes. In order to achieve a proper management of VVC including prevention and treatment, knowing its risk factors is important too.

Materials and Methods

This study was a descriptive retrospective study among 869 fluor albus patients in Sexually Transmitted Infection (STI) Division, Dermatology and Venereology Outpatient Clinic in Dr. Soetomo General Hospital, Surabaya, East-Java, Indonesia in 2011 to 2013. A total sampling to 213 medical records of VVC patients were studied. The data were collected in March until December 2015. The variable in this research were age distribution, marital status, sexual partner, recurrence of VVC, and risk factor of VVC. Ethical clearance was given by Medical Research Ethical Committee of Dr. Soetomo General Hospital, Surabaya, East-java, Indonesia.

Results

A total sampling to 213 medical records of VVC patients from 869 fluor albus patients in STI Division, Dermatology and Venereology Outpatients Clinic in Dr. Soetomo General Hospital, Surabaya, East-Java, Indonesia in 2011 to 2013 were studied.

A total number of VVC cases from 2011 to 2013 were 213 (24.51%) from 869 fluor albus patients, and occupied on the second rank of pathological fluor albus (after Non-specific Genital Infection (NSGI)). In 2011, VVC cases were 69 (22.77%) from 303 of fluor albus patients. In 2012, VVC cases were 69 (22.69%) from 304 of fluor albus patients. In 2013, the VVC cases were increasing in number and proportion. Total number of VVC cases in 2013 were 75 (28.63%) from 262 of fluor albus patients (Figure 1.)

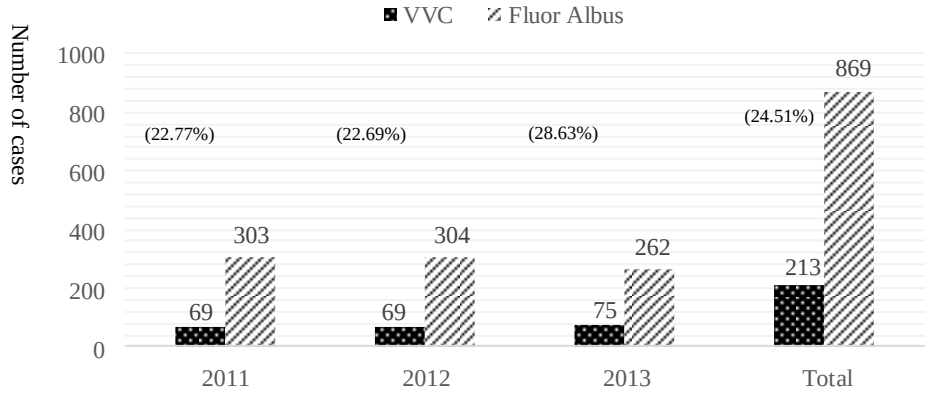

Figure 1: Vulvovaginal Candidiasis in Sexually Transmitted Infection (STI) Division, Dermatology and Venereology Outpatient Clinic in Dr. Soetomo General Hospital, Surabaya, East-Java, Indonesia in 2011 to 2013.

The age distribution of the study is shown in Figure 2. About 180 (84.50%) patients settle the majority of the VVC cases were in sexually active age, which was 15 to 44 years old. And the rest are non-sexually active group. Mostly patients in this study were married (69.48%), and the rest are not yet married, divorce and widow, not yet married. Marital status is shown in Figure 2. About 76.40% of patients confessed their sexual partner were husband, and 5.53% patients confessed their sexual partner were their boyfriend (Figure 4.). Mostly patients were on their first episodes of VVC (55.87%), but about 95 (44.13%) patients presented with recurrent VVC. The recurrence of VVC patients is shown in Figure 5.

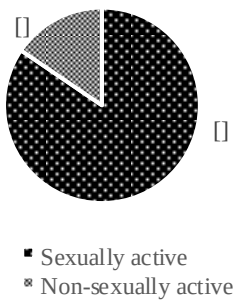

Figure 2: Age distribution of VVC patients

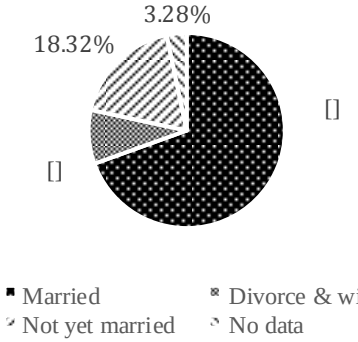

Figure 3: Marital status of VVC patients

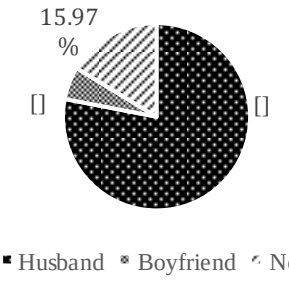

Figure 4: Sexual partner of VVC patients

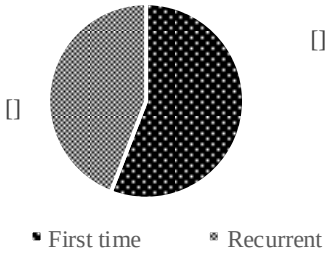

Figure 5: Recurrence of VVC patients

Risk factors of VVC is shown in Figure 6. Previous STIs was the first commonest risk factors, about 74 patients (51.39%). The previous STIs in this study were Non Specific Genital Infection (NSGI), Condyloma acuminate, Bartholin Abscess, Genital Herpes simplex, and Gonorrhea. Vaginal *douching* was on the second place (27.70%). Third commonest risk factors were pre-martial sexual intercourse (5.63%). And the rest are other STIs (3.29%), diabetes mellitus (2.34%), gestation (1.88%), other *fluor albus* infections (0.94%), *pantyliner* (0.47%), and STIs in sexual partner (3.47%).

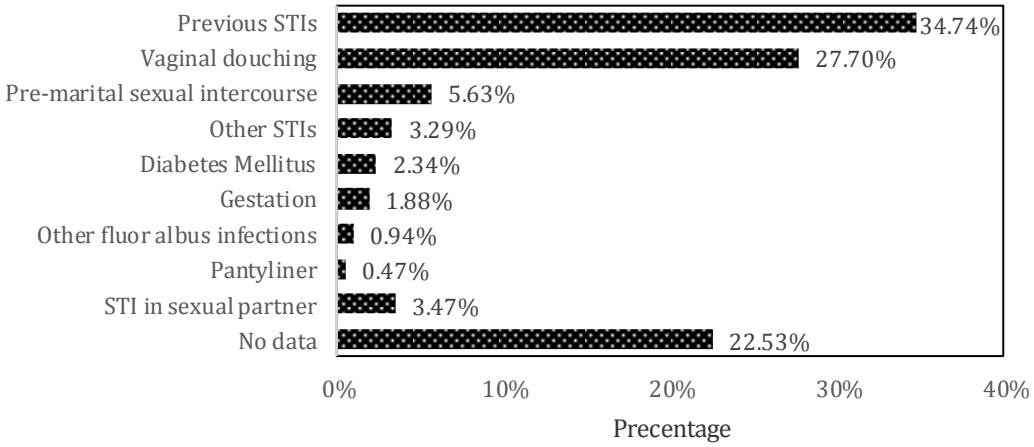

Figure 6: Risk factors of VVC patients, there are patients with more than one risk factors

Discussion

VVC is increasing in number and proportion by year, and occupied in the second rank (24.51%) in this study, after NSGI. Other research in Prof. Dr. R.D Kandou General Hospital, Manado from 2009 to 2011, Bacterial vaginosis was on the first rank as many as 80 (61.07%), followed by VVC 44 (33.59%) patients, and Trichomoniasis 7 (5.34%) patients (Moeri et al, 2013). It showed that VVC is still on top three diagnosis of fluor albus.

Mostly patients in this study were on sexually active age (15 to 44 years old). Sobel (2008), stated that the incidence of VVC increases dramatically in the second decade, because of the onset of sexual activity. The peak of VVC cases is in third and fourth decade, and declines in female older than 40 years old (Sobel, 2008).

Majority of patient's marital status were married (69.48%). Same from the research by Karina and Ervianti (2011) that have done in STI Division Dermatology and Venereology Outpatients Clinic in Dr. Soetomo General Hospital, Surabaya, East-Java, Indonesia in 2007 until 2009 that the majority subject as many as 257 (84%) patients were married (Karina, Ervianti, 2011).

About 95 (44.13%) patients presented with recurrent VVC. O'connor and Sobel (1986) stated that 20 to 25% of negative vaginal cultures of woman turn positive in 30 days after antimycotic therapy. It is strongly prove that the concept of vaginal persistence of some strains of yeast and opposed vaginal as intestinal reservoir (O'connor, Sobel, 1986).

Previous and Other STIs were common risk factor of VVC in this study. STIs is a cofactor that support the incidence of VVC. By suffered from STI, can alter the vaginal micro-environment that can trigger overgrowth of *Candida* species. Pre-marital sexual intercourse plays role too in triggering VVC incidence because it can alter the humidity of vaginal area, So that, pre-marital sexual intercourse can be a cofactor of VVC case too.

Vaginal douching (27.70%) is risk factor of VVC in this study. Because vaginal douching can alter the vagina ecosystem. Research that has been done by Ugwa (2015) stated that, 115 of 270 women with VVC, have douching behavior. It showed that vaginal douching is common risk factor in VVC cases (Ugwa, 2015).

Other risk factor is diabetes mellitus (2.34%). Vagina colonization from *Candida* sp. is many found in diabetic woman (Sobel, 2008). On the other hand, research have been conducted by Anindita and Martini (2006), stated that there was no statistically significant in relationship between diabetes mellitus and the incidence of VVC, based on Fisher's exact test with p=1,000 (p>0.05) (Anindita, Martini, 2016).

In this study, the number of VVC cases in pregnant woman was 4 (1.88%) cases. In pregnancy, high level of reproductive hormones provides a glycogen, an excellent carbon source, for *Candida* organisms (McCourtie, Douglas, 1981). Using pantyliner is also risk factor for VVC cases. Pantyliner can transfer intestinal flora, like *Eschericia coli*, to vagina area, and using non-breathable pantyliner can increase the risk of VVC (Farage et al, 1997).

There is no data of other factors may associate with VVC such as hygiene, social economic status, or other metabolic disease besides diabetes mellitus. This is the limitation of this study.

Conclusion

VVC case is increasing by year and occupied on the second rank of pathological fluor albus (after Non-specific Genital Infection). VVC patients mostly occurred in sexually active. Recurrence of VVC patients is about 44.13%. The top six most common risk factors of VVC patients are previous STIs, vaginal douching, pre-marital sexual intercourse, other STIs, diabetes mellitus, and gestation. Avoiding and/or managing risk factors is important to prevent VVC and its complication besides treatment.

Conflict Interest Statement: The authors of this work hereby declares that there is no competing interest among them and that there are also no financial or professional affiliations with any group or company.

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