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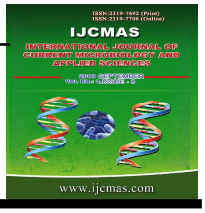

Original Research Article

Risk of vaginal candidiasis among pregnant women

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K e y w o r d s

Vaginal candidiasis; risk; *Candida albicans*; pregnant women; anaemia.

A B S T R A C T

Pregnancy is a physiological state, which produces several normal and expected changes in all the maternal organ systems. Vaginal secretions during pregnancy fall from a pH of greater than 7 (an alkaline pH) to 4 or 5 (an acid pH). This change in pH also unfortunately, favors the growth of *Candida albicans*. It is believed that higher estrogen levels and higher glycogen content in vaginal secretions during pregnancy increase a woman's risk of developing vulvo vaginal candidiasis. The study was conducted to assess the risk of developing vaginal candidiasis among pregnant women in selected Rural Maternity and Child Welfare (RMCW') homes of Udupi district, Karnataka.The study adopted a descriptive survey approach. The sampling technique used was non probability convenient sampling. After obtaining the consent from the subjects, a total of 302 pregnant women those who are visited the antenatal clinics of RMCW's were selected. Data shows majority (53%) of the pregnant women belongs to 'no risk' category and 47% of the pregnant women were at risk of developing vaginal candidiasis. Risk factors detected among these pregnant women were: 52.8% of them had the habit of washing from front to back after using toilet. 39.4% were multipara and 39.4% of the pregnant women had the habit of wearing synthetic undergarments, 35.2% were using scented laundry soap to clean the perineum each time. 33.8% of them were suffering from anaemia. Health professionals caring for pregnant women should enquire about symptoms of vaginal candidiasis, so that appropriate diagnosis and treatment can be initiated, and also they can give them knowledge and make aware, which may help them in improving their health by adopting preventive measures.

Introduction

Among all motivations of women motherhood is the most universal and the strongest. Motherhood is a beautiful and joyous experience to a woman. The feeling of a life growing inside makes her ecstatic.

The health of the mother during pregnancy is important to give birth to a healthy baby. Reproductive tract infections are common during pregnancy and vaginal candidiasis (moniliasis or thrush) is a most

common and frequently distressing infection for many pregnant women. Vulvovaginal candidiasis appears to occur more often in the setting of increased estrogen levels, such as oral contraceptive use (especially when estrogen dose is high), pregnancy, and estrogen therapy.

Pregnancy is a physiological state, which produces several normal and expected changes in all the maternal organ systems. Vaginal secretions during pregnancy fall from a pH of greater than 7 (an alkaline pH) to 4 or 5 (an acid pH). This occurs because of the action of Lactobacillus acidophilus, bacteria that grow freely in the increased glycogen environment, and by so doing increase the lactic acid content of secretions. This changing acid content helps to make the vagina resistant to bacterial invasion for the length of the pregnancy. This change in pH also unfortunately, favors the growth of Candida albicans. Candida infection occurs more frequently in pregnant women. It is believed that higher estrogen levels and higher glycogen content in vaginal secretions during pregnancy increase a woman's risk of developing vulvo-vaginal candidiasis (Plitteri Adele, 2007).

Wilkinson described vaginal Candidiasis for the first time in 1849. Vaginal candidiasis is a fungal or yeast infection of the vulva and/or vagina. Vaginal candidiasis, caused by opportunist yeast, *Candida*, is a common and increasing disease in women (Sobel *et al.*, 1998). Approximately 75% of all women will have a vaginal infection episode during their life span (Lanchares and Hernandez, 2000). Possible risk factors causing an increase in *Candida* infections include prior antibiotic therapy, pregnancy, diabetes mellitus (DM), oral contraceptives containing estrogen and progestin, and immunosuppressed patients (transplanted patients, cancer patients treated with chemotherapy, and HIV patients ((Lanchares and Hernandez, 2000; Guiot *et al.*, 1994).

Jombo *et al.,* (2011) conducted an exploratory survey among 150 pregnant women in West Africa in 2009 on symptomatic vulvovaginal candidiasis: knowledge, perceptions and treatment modalities. Pregnant women were interviewed and urogenital samples subsequently collected and processed during the study period, and a corresponding 153 samples were collected from age matched females who were not pregnant. Result revealed that the rate of urogenital colonization by candida species among pregnant women was 47.7%. While 20.3% was recorded among the control. Those who did not know Candidiasis as a disease were 94.1% and 95.4% could not list at least one urogenital symptom unique to candidiasis; 83.6% of the respondents felt there was no compelling need for treatment while 86.3% did not consider the disease of any serious clinical significance. Also, 94.1% could not mention at least one valid health risk associated with candidiasis. Study concluded that, the rate of symptomatic vulvovaginal candidiasis among pregnant women in Gboko is high with a corresponding low level of awareness and care about the disease. Health education should be instituted at ante-natal clinics so as to raise the knowledge and level of awareness of the people towards seeking prompt and appropriate treatment (Jombo *et al.*, (2011).

Materials and Methods

Data was collected by survey approach from all the pregnant women those who attended antenatal clinic RMCW centre's

and fulfilled the sampling criteria. In this study, 302 pregnant women were selected by non probability convenient sampling method. Demographic proforma, and modified Srivastav Socio economic status scale to assess the socio economic background and risk assessment tool was used to assess the risk of developing vaginal candidiasis. Data were analyzed by using SPSS 16 version.

Result and Discussion

Sample characteristics

Most of the pregnant women (55.96%) who participated in this study were in the age group of 26-33 years, majority of them (80.79%) belongs to Hindu religion, and 53.2% pregnant women were in 3rd trimester. Majority(64.9%) of the pregnant women who attend RMCWs belonged to moderate socio economic status (Table1).

Description of vaginal candidiasis risk score

The pregnant women were surveyed to assess the risk of developing vaginal candidiasis by using risk assessment tool. Risk status was classified as 'no risk' with the score of 'zero' and 'with risk' with the score of 'one' and above. Out of 302 pregnant women 53% belonged to 'no risk' category, where as 47% belonged to 'with risk' category (Fig 1) .

Description of risk factors of vaginal candidiasis

Majority of the pregnant women (52.8%) who were at risk of developing vaginal candidiasis were having the habit of washing from front to back after using toilet. 39.4% were multipara, 39.4% of the pregnant women had the habit of wearing synthetic undergarments, 35.2% were using scented laundry soap to clean the perineum each time, 33.8% of them were suffering from anaemia, 29.6% of the women had severe vaginal discharge, 26.9% of them had vulval itching and 26.8% of the women had previous history of vaginal candidiasis

The findings of the present study indicated that out of 47% with risk samples, most of the pregnant women (52.8%) belonges to the age group of 26-33 years. Majority of the pregnant women (57%) were in 3rd trimester and 32.4% of them were in 2nd trimester and rest were in 1st trimester. Health personnel (33.8%) were the major source of health information for many of subjects. Most of the pregnant women (83.14%) who attended RMCWs belonged to moderate socio economic status. The findings of the present study are supported by following studies:

A prospective study which is conducted in UK by Akinbiyi A, to determine the prevalence and age distribution of Candida albicans among asymptomatic pregnant women and detected prevalence of candida albicans was 12.5%, and the highest percentage of women (65.7%) was in the age group of 21–30 years (Akinbiyi *et al.*, 2009). Anis Ahmad and Asad U. Khan conducted a prospective study in Aligarh, India, among 1050 women, result revealed that women of the 21–25 age group had the highest frequency of *Candida*-positive cultures followed by 26–30 age groups (Anis Ahmad and Asad U.Khan, 2009). C L Goh and Tirumoorthy conducted a study on Vaginal candidiasis in UK, majority of the cases who harbour candida in vagina belonged to the reproductive age group between 20 to 39 years of age.

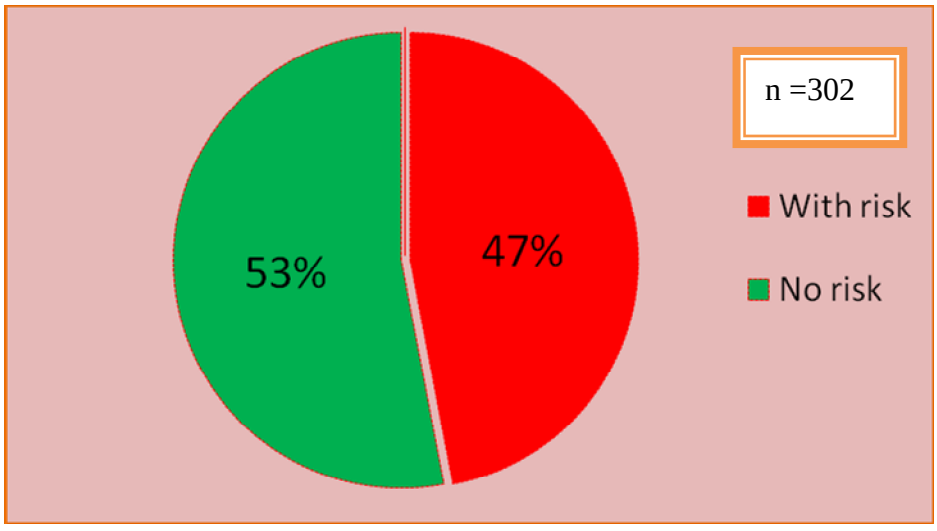
Table.1 Frequency and percentage distribution of sample characteristic

Sample Characteristics	f	%
Age in years		
18 - 25	116	38.4
26 - 33	169	55.9
34 - 40	17	5.6
Trimester of pregnancy		
1st	41	13.6
2nd	101	33.4
3rd	160	53.2
Religion		
Hindu	244	80.7
Christian	03	0.9
Muslim	55	18.2
Health information source		
News paper	28	9.2
Magazines	10	3.3
Television	103	34.1
Radio	12	3.9
Health Personnel	92	30.4
Family members	38	12.5
Friends	13	4.3
Neighbors	06	1.9
Socio Economic Status		
Low	18	5.9
Moderate	259	85.7
High	25	8.2

Table.2 Frequency and percentage description of risk factors of vaginal candidiasis
n = 142

Risk factors of vaginal candidiasis	Yes	
	f	%
Severe vaginal discharge	42	29.6
Vulval itching	37	26.9
Previous history of vaginal candidiasis	38	26.8
Oral contraceptive pills (OCP) users	6	4.2
Recent Antibiotic users	9	6.3
Diabetic	3	2.1
On steroids	2	1.4
Multipara	56	39.4
Taking Anti allergic drug for allergy	4	2.8
Suffering from anemia	48	33.8
Suffering from hypothyroidism	7	4.9
Worm infestation problem	24	16.9
Multiple sexual partners	1	0.7
Wear tight undergarments	3	2.1
Think it is not necessary to change wet under garment	1	0.7
Douches vagina	3	2.1
Wear synthetic undergarments	56	39.4
using scented laundry soap	50	35.2
sensitive to any perfumes or talcum powder	3	2.1
Washing from back to front after using toilet	75	52.8

Figure.1 Pie diagram showing percentage of risk category of vaginal candidiasis among pregnant women



Kikani, (2010) conducted a study in Gujarat (2009) among 1000 women detected that, the incidence of vaginal candidiasis in pregnant women increases with gestation period, lowest in first trimester (30.4%) , in second trimester (39.3%) and highest (43.4 %) in third trimester.**(11)** 'this study also support the findings of present study.

This study revealed that 47% of the samples belonged to 'with risk' category i.e., they are at risk of developing vaginal candidiasis. The findings of the present study are supported by following study. A study by Praveen NA *et al.,* conducted among 110 pregnant women in Isra University, Hyderabad revealed that frequency of vaginal candidiasis during pregnancy was 38% (Parveen *et al.,* 2008).

Goh and Tirumoorthy conducted a study in UK, found that a high percentage (32.1%) of patients gave a past history of vaginal candidiasis over the past one year and a high portion of the patient had haemoglobin of less than 11 gram/dl. The main symptoms were pruritus vulvae and vaginal discharge. **(10)** This study supports

the findings of present study, out of 47% with risk samples, 33.8% of them were suffering from anaemia, 37.5% of the pregnant women had severe vaginal discharge, 29.6% of them had vulval itching and 26.8% of the women had the previous history of vaginal candidiasis

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