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*Original Research Article*

# Prevalence of Asymptomatic and Symptomatic Vulvovaginal Candidiasis among Pregnant Women Attending Hospitals in Vellore District, Tamilnadu, South India

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## ABSTRACT

The aim of our study was to assess the prevalence of candidiasis among pregnant women with symptoms and without symptoms attending Government Hospitals in Vellore district, Tamilnadu. Studies have shown that women are more prone to infection of *Candida* during their pregnancy due to various factors in different age groups. All vaginal swabs were examined by conventional and automated VITEK method. A total of 210 samples were collected from different age groups (20 -39 years) pregnant women irrespective of asymptomatic or symptomatic. Out of 210, 168 samples showed positive for vaginal candidiasis. Among 168 samples 75 samples were collected from Asymptomatic samples were colic pregnant women which showed positive for 58 (77%) and 17 (23%) as negative. And 135 samples from symptomatic showed positive for 110(81%) and negative for 25 (19%). Distribution was also done among age groups (20-39 years) for both symptomatic and asymptomatic pregnant women. This study concludes that vulvovaginal candidiasis was more common in pregnant women based on age groups.

***Keywords:*** Vulvovaginal candidiasis, Pregnancy, Asymptomatic, Symptomatic

## INTRODUCTION

*Candida albicans* is the most common cause of fungal infections, leading to a range of life threatening invasive to non-life threatening mucocutaneous diseases. Vaginal candidiasis is a frequent companion of pregnancy, which greatly complicates the course of the pregnancy and threatens the health of both mother and child. [(1)] *Candida albicans* are part of the lower tract flora in 20-50% of healthy asymptomatic women. [(2)] *Candida albicans* is the most frequent colonizer and is incriminated in most cases of VVC (Vulvovaginal candidiasis). [(3)] VVC can be recurrent or relapsing. [(4,5)] Recurrent or relapsing VVC occurs when a women presents with four or more episodes par year. This condition affects less than 5% of healthy women. [(6)] The pathogenesis and prognosis of candida infections are affected by the host immune status and also differ greatly according to disease presentation. Therefore diagnosis, management and treatment choices vary and need to be considered in the overall setting of the human host. Atleast 75%women suffer once in their lifetime from one episode of a *Candida* infection. [(7-9)] The clinical manifestation of the disease is characterized by vaginal pruritus, thick curd or cheese like vaginal discharge, itching, redness, burning, swelling and pain during walking and urination. [(10,11)] People with diabetes are

more likely to develop candidiasis because of the elevated level of the sugar in the body provides food for the yeast and encourage its overgrowth. [(12)] Vaginitis can cause more inconvenience than any other gynaecological symptoms. Increased secretion of reproductive hormones during pregnancy favors infection. High levels of estrogen provide an increased amount of glycogen in the vagina, furthermore providing a good source of carbon needed for *candida* growth and their germination. [(13)]

This study gives a clear understanding of prevalence of *Candida albicans* infections in pregnant women on the basis of their age groups in both symptomatic and asymptomatic women.

## MATERIALS AND METHODS

### 1. Study population

A total of 210 pregnant women attending government hospitals in Vellore district, Tamilnadu, India were selected and collected the vaginal swabs from both symptomatic and asymptomatic ranging from 29 to 39 years of age groups. The approach was based on universal screening of all pregnant women for *candida albicans* infection.

### 2. Sample collection

A total of 210 samples of vaginal swabs were collected from asymptomatic and symptomatic pregnant women between the ages of 20 -39 years attending the hospitals for regular checkups. Each pregnant woman was accepted the verbal consent. Structured questionnaires were used by attending physicians to obtain data as age, marital status, prior antibacterial therapy, clinical signs and symptoms and provisional diagnosis. [(14)] All vaginal swabs collected and transported to Biosparge (Redefined) lab with the help of Amies transport medium.

### 3. Macroscopic examination of samples

Two samples were collected and each sample was examined for color, appearance and odour described as whitish or whitish grey color discharge. One swab was used for microscopy for wet preparation and Gram stain and the other was used for SDA culturing and incubated at 37ºC for 24 hours.

### 4. Microscopic examination of samples

Wet mount preparations were done to observe the budding cells. After incubation the colonies were stained to confirm Candidal morphology.

### 5. Species identification

The species identification was based on Germ tube test, Sugar assimilation test according to Guidelines of the CDC, Sexually transmitted diseases treatment Guidelines 2010 [(15)]

### 6. Germ tube test

Small inoculum of suspected Candida cultures were inoculated into 1 ml of human serum in a small tube and incubated at 37 C for 2 hours. After incubation, a loop full of culture was placed on a glass slide, overlaid with a cover slip and examined microscopically for the presence or absence of germ tubes. Formation of germ tubes was seen as long tube like projections extending from the yeast cells with no constriction or septa at the point of attachment to the yeast cells [(16-19)]

## RESULTS

This was a 6 month study on vulvovaginal candidiasis among pregnant women aged 20-39 years with and without clinical signs. And a total of 210 samples were collected for isolation and identification of *Candida albicans* from both asymptomatic and symptomatic pregnant women. Out of 210 samples 168 were positive for *Candida albicans* infections.

Among 168 positives samples 75 samples were collected from asymptomatic pregnant women and 58 (77%) samples showed positive and 17 (23%) showed negative (Table.1)

135 samples were collected from the pregnant women with symptoms and 110 (81%) showed positive and 25 (19%) showed negative (Table. 2).

Age wise distribution were also studied among the pregnant women (Table. 3, 4)

**Table.1 Prevalence of Candidiasis in Asymptomatic pregnant Women**

| Culture | No. of Asymptomatic pregnant women | Percentage (%) |
|---|---|---|
| Positive | 58 | 77% |
| Negative | 17 | 23% |
| Total | 75 | 100% |

**Table: 2 Prevalence of Candidiasis in symptomatic pregnant Women**

| Culture | No. of Symptomatic pregnant women | Percentage (%) |
|---|---|---|
| Positive | 110 | 81% |
| Negative | 25 | 19% |
| Total | 135 | 100% |

**Table: 3 Distribution of Age group among asymptomatic vaginitis in pregnant women**

| | | | Positive | Negative | Total | Significance (Chi Square) |
|---|---|---|---|---|---|---|
| Age (Years) | 20-24 | Count | 14 | 01 | 15 | P>0.05 |
| | | % Within Age Group | 93% | 07% | 100% | |
| | 25-29 | Count | 20 | 05 | 25 | |
| | | % Within Age Group | 80% | 20% | 100% | |
| | 30-34 | Count | 12 | 06 | 18 | |
| | | % Within Age Group | 67% | 33% | 100% | |
| | 35-39 | Count | 12 | 05 | 17 | |
| | | % Within Age Group | 70% | 30% | 100% | |
| Total | | | 58 | 17 | 75 | |

**Table: 4 Distribution of Age group among symptomatic vaginitis in pregnant women**

| | | | Positive | Negative | Total | Significance (Chi Square) |
|---|---|---|---|---|---|---|
| Age (Years) | 20-24 | Count | 18 | 17 | 35 | P>0.05 |
| | | % Within Age Group | 51.4% | 48.6% | 100% | |
| | 25-29 | Count | 37 | 30 | 40 | |
| | | % Within Age Group | 92% | 08% | 100% | |
| | 30-34 | Count | 27 | 30 | 30 | |
| | | % Within Age Group | 90% | 10% | 100% | |
| | 35-39 | Count | 28 | 20 | 30 | |
| | | % Within Age Group | 93% | 07% | 100% | |
| Total | | | 110 | 25 | 135 | |

## DISCUSSION

Candidal infection in pregnant women is the important cause of morbidity in pregnancy which can result in miscarriages, preterm delivery. [(20)] This study investigated the investigated the prevalence of vaginal candidiasis among pregnant women with symptoms and without symptoms for 6 months. This study showed high prevalence of vaginal candidiasis among pregnant women with symptoms (81%) compared to females without symptoms (77%) and at the age group of 20 -29. The cause may be high sexual activity, poor personal hygiene, the use of contraceptives and the drug abuse among this age group. [(21)] This is similar to the reports of in India and in Iran. [(22)] However low level of *candida albicans* occurrence has been reported in New York [(23)] and it may be due to the result of good personal hygiene, appropriate nutrition, adequate diagnostic facilities and treatment.

## CONCLUSION

From our study it is clear that there is a need to create awareness of the involvement of *candida albicans* in genital discomfort, especially vulvovaginitis, among non-pregnant women with or without notable signs and symptoms. The net results of this study give a clear picture of the importance of the different risks factors that play a role in C*andida albicans* colonization in pregnant women.

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