

# Frequency of undiagnosed diabetes mellitus in patients with vaginal candidiasis

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## Abstract

**Objective** To determine the frequency of undiagnosed diabetes mellitus in patient with vaginal candidiasis.

**Methods** This is a cross-sectional study. It was conducted in DHQ Hospital Sargodha from June 2017 to December 2017. A total number of 160 patients were enrolled for the study ranging from the age of 20-60 years. After informed consent from all patients, high vaginal swab was taken from vagina and send for microscopic examination, to confirm the diagnosis of vaginal candidiasis. Fasting blood glucose levels were taken at the same time and were sent to hospital laboratory.

**Results** There were 160 female patients who were selected for study. Frequency of undiagnosed diabetes mellitus in patients with vaginal candidiasis was found to be 33 (20.63%) while 127 (79.37%) patients did not have high blood sugar level. According to marital status, 30(18.75%) were married and rest 3 (1.875%) were unmarried. Out of 33 cases of undiagnosed diabetes, 19 (11.857%) were between 20-40 years of age while 14 (8.75%) were in 41-60 years of age group.

**Conclusion** Frequency of undiagnosed diabetes mellitus is higher among patients with vaginal candidiasis. So, it is advised that every patient who presents with vaginal candidiasis should also be evaluated for diabetes mellitus.

## Key words

Diabetes Mellitus, vaginal candidiasis.

## Introduction

Vaginal candidiasis also known as vaginal yeast infection is a common condition in females during reproductive age.<sup>1</sup> A normal vaginal flora contains bacteria and some yeast cells. The most

common species of fungus i.e. Candida is a naturally occurring microorganism in the vaginal area. Lactobacillus bacteria keeps its growth in check. But when there is imbalance between bacteria and yeast, the yeast cells rapidly multiply.<sup>2</sup> Candida albicans is the cause of 80-95% of causes of fungal vulvo-vaginitis, whereas other species, such as Candida glabrata, Candida parapsilosis and Candida tropicalis are responsible for other cases.<sup>3</sup> This symptoms of vaginal candidiasis include severe itching and irritation in the vagina, an intense burning

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sensation, especially during urinating, redness and swelling of the vulva, vaginal pain and soreness and a typical curdy white vaginal discharge.<sup>4</sup> Mycological examination by a wet preparation (with 10% KOH solution) under direct microscopy is considered gold standard for diagnosis. This is also called vaginal wet mount or wet smear.<sup>5</sup> This test is quite affordable & accessible for patients.

In general, different metabolic alterations are caused by uncontrolled diabetes mellitus. This includes raised amount glycogen in the body. This elevated glycogen may cause increased colonization of *Candida* in susceptible individuals.<sup>6</sup>

During clinical practice, an association has been observed between vaginal candidiasis and undiagnosed diabetes mellitus. Therefore, a study was designed to illustrate the relation between frequency of unidentified diabetes mellitus in patients with vaginal candidiasis. This may lead in future to properly manage these patients and to reduce the rate of complications in these patients.

## Methods

This is a cross-sectional study, which was conducted in DHQ Hospital Sargodha from June 2017 to December 2017. A total number of 90 patients was included. Patients having symptoms of vaginal candidiasis who visited dermatology OPD were included. Patients selected were between the age of 20-60 years. Exclusion criteria was patients with history of diabetes mellitus & immunosuppressive disorders like HIV, organ transplant history, carcinoma etc. Informed consent was taken from all patients who fulfilled inclusion criteria. Vaginal smear was taken by help of sterilized high vaginal swab. The sample is then smeared upon a microscope slide. The slide is observed by wet

mount microscopy by placing the specimen on a glass slide and mixing with 10% KOH solution. After this direct microscopy was done to confirm diagnosis in microbiology laboratory of DHQ teaching hospital, Sargodha. In addition, fasting blood glucose was measured by chemistry analyzer in biochemical laboratory of DHQ teaching hospital, Sargodha.

## Results

There were 160 female patients who were selected for study. Frequency of undiagnosed diabetes mellitus in patients with vaginal candidiasis was found to be 33 (20.63%) while 127(79.37%) patients did not have high blood sugar level.

According to marital status, out of 33 newly diagnosed cases of diabetes, 30 (18.75%) were married and rest 3 (1.875%) were unmarried. Stratification of age is shown in **Table 2** where out of 33 cases of newly diagnosed diabetes, 19 (11.857%) were between 20-40 years of age while 14 (8.75%) were in 41-60 years of age group.

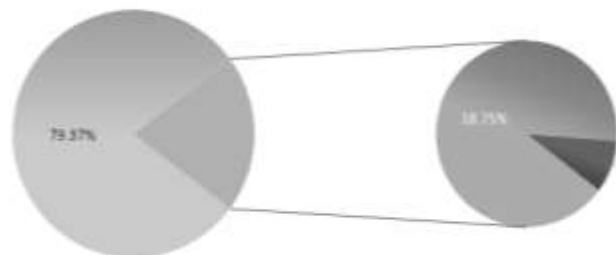
## Discussion

Vaginal Candidiasis is a common fungal infection caused by a yeast named *Candida*. This yeast is a natural commensal inside the human body especially abundant in mouth, throat, gastrointestinal tract, vagina and on skin. In these places it lives in a dormant phase.<sup>7</sup> Inside the vagina a bacteria, *Lactobacillus* regulates the growth of *Candida*. In certain condition when there is imbalance between bacteria and yeast, the yeast cells rapidly multiply. This leads to vaginal candidiasis also known as “vulvovaginal candidiasis,” or “candidal vaginitis”.<sup>2</sup>

The signs and symptoms of vaginal candidiasis include vaginal itching and soreness, pain or

**Table 1** Frequency of undiagnosed diabetes mellitus in patients with vaginal candidiasis. (n=160) with relation to marital status of patient.

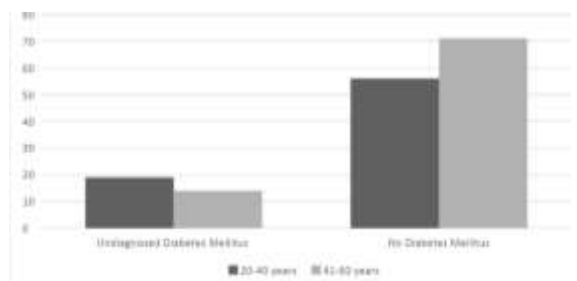
|                      |              |           |             |
|----------------------|--------------|-----------|-------------|
| Undiagnosed diabetes | 33 (20.63%)  | Married   | 30 (18.75%) |
|                      |              | Unmarried | 3 (1.875%)  |
| No Diabetes Mellitus | 127 (79.37%) | Married   | 112 (70%)   |
|                      |              | Unmarried | 15 (9.375%) |



**Figure 1** Frequency of undiagnosed diabetes mellitus in patients with vaginal candidiasis.

**Table 2** Stratification for age (years) undiagnosed diabetes.

|                      |              |           |              |
|----------------------|--------------|-----------|--------------|
| Undiagnosed diabetes | 33 (20.63%)  | 20-40 yrs | 19 (11.857%) |
|                      |              | 41-60 yrs | 14 (8.75%)   |
| No Diabetes Mellitus | 127 (79.37%) | 20-40 yrs | 56 (35%)     |
|                      |              | 41-60 yrs | 71 (44.375%) |



**Figure 2** Stratification for age (years) in patients with vaginal candidiasis.

discomfort when urination and typical curdy white vaginal discharge.<sup>8</sup> Although most cases of vaginal candidiasis are mild, some may develop severe infections leading to redness, swelling, and cracks in the wall of the vagina.<sup>4</sup> The risk of vaginal candidiasis is increased in patients who are pregnant, using hormonal contraceptives, have poor immunity (for example having HIV infection, cancer) or who have recently taken antibiotic.<sup>2</sup> Mycological examination by a wet preparation (with 10% KOH solution) under direct microscopy is

considered gold standard for diagnosis from many decades.<sup>5</sup> Some laboratory results show that there is higher incidence of vaginal candidiasis in patients with diabetes mellitus.

Diabetes mellitus is a multisystem disorder which leads to malfunctioned cell-mediated immunity. In addition, diabetes mellitus leads to increased level of glycogen in the body. This can be an added factor and may cause increased colonization of *Candida* in susceptible individuals.<sup>6</sup> That's why poor glucose control and low immunity both increase the chances of vaginal candidiasis.<sup>9</sup>

In our study 33 (20.63%) patients were diagnosed to have previously undiagnosed diabetes mellitus. Most of these patients were married 30 (18.75%). Amongst the patients who were diabetic, 19 (11.857%) were having age of 20-40 and only 14 were 41-60 years old. This shows signification association between fungal infections and diabetes mellitus. A recent study in 2017 at Birdem general hospital has shown that diabetes mellitus causes higher incidence of infections like Emphysematous pyelonephritis (EPN), Mucormycosis, Malignant otitis externa and Melioidosis.<sup>10</sup> In a similar study, a total 20,171 hip and knee arthroplasty procedures were evaluated. It was observed that there is a significantly higher risk of prosthetic joint infections (PJIs) among patients who had diabetes mellitus.<sup>11</sup> This again points out to the fact that diabetics are more prone to acquire microbiological infections.

## Conclusion

The frequency of undiagnosed diabetes mellitus is higher in patients with vaginal candidiasis. So, it should be recommended in our clinics that every patients of vaginal candidiasis should be checked out for diabetes mellitus.

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