
Frequency of Vaginal Candida in Diabetes Patients – Overview

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Abstract

Aim/objective: The aim of the article is to identify the frequency and prevalence of vaginal candida in diabetes patients.

Background: Rising blood sugar levels in patients increase the risk of various diseases and increase health problems. Possible long-term effects include damage to the macrovascular and microvascular vessels, which can lead to vascular diseases, including heart attack, stroke, and problems with the kidneys, eyes, gums, legs, and nerves. In addition to vascular damage, diabetes causes bacterial and fungal infections, among which we often find infection caused by Candida. Fungal disease of the genitals is one of the most common pathologies today, the development of which can be facilitated by both external - exogenous and internal - endogenous factors.

Design and Methods: The article is based on secondary research and is limited to descriptive analysis.

Results and Conclusions: Increased blood sugar levels as a result of diabetes affect the whole body and not just the blood. Elevated blood sugar appears in the mucous membranes of the vagina and vulva, so they are an excellent means of cultivating yeast. Properly managed diabetes is the only correct way to prevent recurrent vulvovaginal candidiasis.

Keywords: *Diabetes, Vaginal Candida, High Glucose level, Uncontrolled Diabetes.*

Introduction

Diabetes mellitus is a dyshormonal, chronic metabolic disease. The existence of the disease has been known historically since ancient times. An Egyptian papyrus dating to 1550 BC has been found to provide information on diabetes, in particular, that the disease is characterized by the excretion of large amounts of urine. (3) In diabetes, the human body is unable to absorb sugar normally, and consequently its level in the blood increases, developing hyperglycemia, which may be caused by

insulin secretion or a defect in its action. There are times when both are together. In the absence of insulin, glucose does not reach the cell and remains in the blood, causing the cells to starve. After eating, blood sugar levels rise, more insulin is produced in the body, and cells absorb more glucose from the blood (13). As a result, the cells receive the necessary energy, and the blood sugar level is lowered. This is the norm at the time. In the case of insulin deficiency, blood sugar levels rise after eating. The degree of increase depends on the number of carbohydrates in the body. (6).

The psycho-emotional sphere of patients with diabetes is of considerable importance, as it changes the rhythm of life, which is due not only to the constant control of blood sugar but also to diseases of the kidneys, cardiovascular system, and various lesions of the skin and mucous membranes. (2).

Coronary artery disease and stroke are the most common manifestations and the most common cause of death in people with diabetes. Modification of cardiovascular risk factors (e.g., hypertension and dyslipidemia) is of great importance in the long-term treatment plan. Metformin and glucose-lowering drugs that are beneficial to the cardiovascular system, such as the sodium-glucose transporter 2 inhibitor or glucagon-like peptide-1 receptor agonist, are used. (5).

Skin damage in diabetes is associated with impaired carbohydrate metabolism. As blood sugar levels rise, excess urine is excreted, resulting in dry skin, itchy skin, impaired function of the sebaceous glands, and an increased risk of developing skin infections, such as bruises and trophic ulcers. For decompensated and long-term diabetes, the so-called. Genital diabetes usually occurs with personal hygiene. Microbial or fungal lesions invade the folds of the perianal and external genitalia. The risk of sexual and urological problems during diabetes increases when: the patient is unable to properly regulate glucose levels; Has a high blood cholesterol content; Has high blood pressure; Has excess weight; Is over 40 years of age; Is an active smoker; Engages in a physically passive life. Diabetes mellitus causes bacterial and fungal infections, among which we often find infection caused by *Candida*. Fungal disease of the genitals is one of the most common pathologies today, the development of which can be facilitated by both external - exogenous and internal - endogenous factors. Under the influence of external factors, fungal flora enters the body, which suppresses the overall reactivity of the body, while endogenous factors, such as chronic diseases, reduce the body's ability to resist. (1) Fungal disease of the genitals is relatively rarely caused by the fungus *Torulopsis* (*Torulopsis*), with *Candida Albicans* playing a leading role. The disease caused by yeast fungi of the genus *Candida* is called candidiasis. *Candida albicans* is a single-celled microorganism and is widespread. They can be found in fruits, vegetables, dairy products, and bathed water. About 80 species of *Candida* are known, although only 10 of them can cause human disease. *Candida* is a conditionally pathogenic fungus for humans - the development of the disease is highly dependent on the state of immunity. A weakened person may develop generalized candidiasis. It is not uncommon to combine with another infection.

In developed countries where modern medicines, especially antitumor and antimicrobial antibiotics are used with great frequency, *Candida* is among the most common nosocomial pathogens. In a country where modern methods of treatment are relatively rarely used, due to their high values, candidiasis of the deep organs is extremely rare and most of the cases are presented in the form of skin and mucosal infections. Fungi of the genus *Candida* directly stimulate the causes of bacterial infections,

as well as cause a decrease in the susceptibility of bacteria to antibiotics and other drugs. This is why imbalance is caused, which leads to the development of dysbacteriosis and then candidiasis. Indeed, the cause of candidiasis is sexually transmitted, usually developing as a result of sexual contact with an infected or infected person. Often a candidal infection develops in the body when the human immune system is suppressed. Candidiasis is not classified as venereal disease, although it is discussed with them because of its similar clinical picture. Candidiasis can develop for several reasons, such as unprotected sexual intercourse with an infected partner, taking antibiotics that damage the natural intestinal microflora, diabetes and carbohydrate metabolism, immunodeficiency conditions that mainly affect people who are infected with Climate change, dysbacteriosis, contagious infectious diseases, pregnancy in which estrogen levels rise significantly, leading to disease. (n.d.)

Vulvovaginal candidiasis is usually accompanied by itching, pain, and discharge, which is usually thin, although it may be scaly. In patients with vulvovaginal candidiasis, superficial expression of Dectin-1, the major cognitive factor of beta-glucan on the surface of Candida, is impaired, leading to impaired CARD 9 function and, ultimately, a predisposition to recurrent vaginal infections. Many researchers suggest that vulvovaginal candidiasis (VVC) is more common in people with diabetes. In addition, chronic recurrent VVC may be a marker of diabetes. Whether diabetes causes more symptomatic and/or recurrent VVC episodes is a matter of debate.

Bacteria, viruses, and fungi, including yeast, can cause infections if the human immune system is unable to control the levels in the body. As a 2018 study - which included data from more than 300,000 people - showed, a person with type 1 or type 2 diabetes has a higher risk of infection, including yeast infection, than a person without the condition.

Symptoms in people with diabetes may worsen faster than in other people. Also, treating infections can be more difficult. If the infection is not cured, it can lead to complications. Researchers are still trying to establish a link between yeast overgrowth and diabetes. These may include the following factors such as diabetes and immune dysfunction. In type 1 diabetes, a problem with the immune system causes damage to the cells of the pancreas, and immunological changes and inflammation play a large role in the development of type 2 diabetes. Poorly controlled diabetes can inhibit the immune response. This may be part of the reason why diabetes makes a person more prone to yeast infections. (14)

The study of the exact link between diabetes and the immune system continues. There is a theory based on which it can be said that high blood sugar levels cause the inhibition of certain immune proteins. These proteins, called beta-defensins, help immune cells fight infections and kill germs. Diabetes can also make it easier for yeast and other pathogens to come into contact with skin cells and mucous membranes. This can be caused due to the presence of high titers of glucose in the blood, which allows the yeast to colonize. Yeast feeds on sugar, making this secretion the most likely growth factor. People with diabetes also have elevated levels of glycogen, a polysaccharide that the body uses to store glucose. Excess glycogen in the vagina can increase acidity, which promotes yeast growth (14).

Increased blood sugar levels as a result of diabetes affect the whole body and not just the blood. "High blood sugar builds up in the vaginal and vulvar mucosa, so they are an excellent breeding ground

for yeast." Says Daniel Einhorn, MD, former president of the American Association of Clinical Endocrinologists and medical director at the Scripps Whiter Diabetes Institute in San Diego. Yeast gets its energy from sugar, so in a humid environment with sugar yeast can grow excessively. The effects of diabetes on the body become more apparent over time. People who do not control their blood sugar well may develop complications that are associated with persistently high levels. One such complication is the difficulty of fighting bacterial or fungal infections. Dr. Einhorn explains: "Some women, especially those with poorly controlled diabetes, have some compromise in their ability to fight off any infection." This means that once the yeast infection starts, it is not so easy to get rid of it. (11)

Candida species were isolated in 30 of 76 (39%) patients with type 1 diabetes. Subjects who had candidiasis colonization and candidiasis were all acute. The predominant species of Candida isolated from patients with type 1 diabetes were *C. Albicans* 50%, *C. glabrata* 36.6%, *C. crusei* 3.3%, *C. spicies* 6.6% and *C. dubliniensis* 3.3%. 42 patients had symptoms. The prevalence of candidiasis in symptomatic patients was 59.2%. Subjects with vulvovaginal candidiasis had higher mean HbA1c than those without such infection (7,8). There appears to be a significant association between hyperglycemia and vulvovaginal candidiasis in patients with type 1 diabetes. Improving glucose control may reduce the risk of candidiasis and potentially symptomatic infection in children with diabetes.

Improving glucose control and possibly altering sexual behavior may reduce the risk of Candida colonization and potentially symptomatic infection in women with diabetes. (12)

Discussion

Most women have yeast organisms as part of their normal flora that lives on and inside the body. The number of microorganisms is limited and does not cause any discomfort or symptoms, however, when excessive growth is observed, the problem becomes the subject of research. It has not been studied why fungal infections are more common in women with type 2 diabetes, but given the link between diabetes and vaginal candidiasis, it is possible to determine how well a patient controls their blood sugar levels and how it is managed.

In addition to the analysis of existing studies, the analysis of various cases highlights the importance of diabetes control for the prevention of candidiasis. Case 1: A 32-year-old woman has a wife and two children. Notes that he has been suffering from recurrent candidal cervicitis for two years. Has conducted various types (topical or systemic antifungal therapy). The condition improved on the background of treatment, and after 2-3 weeks relapse develops again. The wife was also present at various clinics, although no sexually transmitted disease was detected.

The patient's mother has a history of diabetes. Blood glucose levels were examined and type 2 diabetes mellitus was detected, which was first diagnosed. (Fasting - 170, and after eating - 240) After consultation with an endocrinologist, appropriate treatment was prescribed. At the same time, the use of antifungal drugs was started locally. After 6 months of treatment for type 2 diabetes, no recurrence of vaginal candidiasis was observed. (Diabetes was cured and candidiasis did not recur)

Case 2: A 55-year-old woman, is overweight. Celebrates the existence of diabetes for 6-7 years. It is during this time that he suffers from itching in the genital area, burning, and itchy discharge. The patient reportedly underwent antifungal treatment several times, but to no avail. The first thing that was done was to check the blood glucose content and it turned out to be a pretty high number (200-300). According to the patient's child, the mother irregularly receives the treatment prescribed by the endocrinologist, and consequently, the complaints increase.

After a long conversation, we achieved that the patient began to use the prescription regularly by the endocrinologist, performed daily control of blood glucose levels, and took antifungal drugs both orally and topically. After several months of observation, no recurrence developed.

All of the above indicate that in recurrent candidiasis it is necessary to suspect endocrine pathology and it is necessary to determine blood glucose.

Conclusion

As the application has shown us, the problem is quite topical. Diabetes not only damages the internal organs, blood vessels, skin, and mucous membranes but also has a severe effect on the patient's psycho-emotional factor. Such patients are overly sensitive, and irritable, which often even causes a stroke. Based on the research found or the observations made by us and the condition of the patient evaluated correctly, it can be boldly said that properly managed diabetes is the only correct way to prevent recurrent vulvovaginal candidiasis.

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Acknowledgement

The authors thank the International organizations and the authors for their work whose research findings were used in the article.

Conflict of Interest

There is no Conflict of Interest. The article protects the copyright of the used literature. The style is preserved, and the paraphrase used is indicated by the author. The source information is not distorted, nor are the authors compromised.

No financial assistance was used while working on the article.

Author contributions

Authors share copyright equally. They contributed to finding relevant publications, summarizing and interpreting/analyzing them, also revising critically for important intellectual content, and writing the manuscript. By all authors was final approval of the version to be published.

ვაგინალური კანდიდოზის სიხშირე შაქრიანი დიაბეტით დაავადებულებში - მიმოხილვა

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აბსტრაქტი

მიზანი: სტატიის მიზანია შაქრიანი დიაბეტის მქონე პაციენტებში ვაგინალური კანდიდოზის სიხშირისა და გავრცელების იდენტიფიცირება.

ისტორია: პაციენტებში სისხლში შაქრის დონის მატება ზრდის სხვადასხვა დაავადების რისკს და ზრდის ჯანმრთელობის პრობლემებს. შესაძლო გრძელვადიანი ეფექტები მოიცავს მაკრო-სისხლძარღვთა და მიკროსისხლძარღვების დაზიანებას, რამაც შეიძლება გამოიწვიოს სისხლძარღვთა დაავადებები, მათ შორის გულის შეტევა, ინსულტი და თირკმელების, თვალების, ღრძილების, ფეხების და ნერვების პრობლემები. გარდა სისხლძარღვთა დაზიანებისა, შაქრიანი დიაბეტი იწვევს ბაქტერიულ და სოკოვან ინფექციებს, რომელთა შორის ხშირად გვხვდება კანდიდოზით გამოწვეული ინფექცია. სასქესო ორგანოების სოკოვანი დაავადება დღეს ერთ-ერთი ყველაზე გავრცელებული პათოლოგიაა, რომლის განვითარებასაც ხელს უწყობს როგორც გარეგანი - ეგზოგენური, ასევე შინაგან-ენდოგენური ფაქტორები.

დიზაინი და მეთოდები: სტატია ეფუძნება მეორად კვლევას და შემოიფარგლება მიმოხილვითი ანალიზით.

შედეგები და დასკვნები: დიაბეტის შედეგად სისხლში შაქრის დონის მატება გავლენას ახდენს მთელ სხეულზე და არა მხოლოდ სისხლზე. სისხლში ამადლებული შაქარი ჩნდება საშოსა და ვულვის ლორწოვან გარსებში, ამიტომ ისინი შესანიშნავი საშუალებაა საფუარის მოსაყვანად. დიაბეტის სწორად მართვა ერთადერთი სწორი გზაა განმეორებითი ვულვოვაგინალური კანდიდოზის თავიდან ასაცილებლად.

საკვანძო სიტყვები: დიაბეტი, ვაგინალური კანდიდოზი, მაღალი გლუკოზის დონე, უკონტროლო დიაბეტი.