

BALANOPOSTHITIS/BALANITIS ASSOCIATION IN CASE OF UNCONTROLLED T2DM WHO HAVE ATTENDING TERTIARY CARE HOSPITAL

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Abstract

Background: India has the largest number of diabetic patients in the world. India also has the dubious distinction of being termed the “DIABETES CAPITAL OF THE WORLD”. Balanoposthitis/Balanitis is the most predominant opportunistic human mycosis, especially in those diabetic persons that present with unsatisfactory Glycaemic control, some factors including personal hygiene, menopause and circumcision might have a possible role in development of balanoposthitis / balanitis in males and vulvovaginal candidiasis in female. In this study we try to determine the association of candida infection specially balanoposthitis/ balanitis in male diabetic patients. **Materials and Methods:** This study was conducted between September 2022 to Feb 2023 in DARBHANGA Medical College and Hospital, Laheriasarai, Bihar. Sample are collected from male diabetic patient who has sign and symptoms of Balanitis / Balanoposthitis. Sample were processed for fungal culture according to standard microbiological techniques. **Result:** Among the participants Candida infection found more to uncircumcised men with uncontrolled T2DM. Maximum cases were Candida Albicans followed by C. Glabarta, C. C. Tropicalis, C Dubelensis and C.Krusei. **Conclusion:** This studies showed that uncontrolled T2DM patients are more prone to develops urogenital infection like Balanitis/ Balanoposthitis in male patients.

INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disorder. Patient with diabetes mellitus have increased risk of genital infection. The estimations from the International Diabetes Federation reveal that 537 million adults (20 – 79 years) are living with diabetes 1 in 10. This number is predicted to rise to 643 million by 2030 and 783 million by 2045.^[1,2] India has second highest prevalence of adult diabetes in the world. Number of diabetics in 2021 in India- 74.2 million. Number expected by 2045 in India- 124.9 million.^[3] On the other hand, Global Action Fund for Fungal Infections and its partners estimated the global burden of serious fungal infections for more than 6 billion people (over 80% of the world's population.^[4] The Population with T2DM are at a two fold higher risk of developing infections as compared with nondiabetic individual.^[5]

Balanoposthitis is the inflammation of glans penis and prepuce and Balanitis is the inflammation of glans penis occur most frequently in uncircumcised men.^[5]

DM and Genital candidiasis are considerable global prevalence of these two frequently coexistent clinical conditions, it is found that diabetic patients with genitourinary candidiasis are currently pervasive in tertiary care hospitals. Such persons who have poor glycaemic control of diabetes, more prone to Candida colonization of the urogenital region as well as for subsequent infection.^[6-8] From this it is clear that urogenital Candida infections may become even more ubiquitous among diabetic patients in the future scenario. Therefore, given the scarcity of recent and comprehensive sources which provide an integrative and critical overview of the available literature on this topic [Table 1], in this review we aimed to summarize microbiological and clinical facets of urogenital infections of Candida in association with diabetes.

Table 1 Keywords, database, and search time		
Keywords	MeSH term	Database
Balanitis	Balanitis	PubMed, Scopus, RCA
Balanoposthitis	-	PubMed, Scopus, RCA
Vulvovaginitis	Vulvovaginitis	PubMed, Scopus, RCA
Urogenital infections	Urogenital system; infections; pathogenicity	PubMed, Scopus, RCA
Pregnancy	Pregnancy	PubMed, Scopus, RCA
Candida	Candida	PubMed, Scopus, RCA
Candidiasis	Candidiasis	PubMed, Scopus, RCA
Diabetes	Diabetes mellitus; diabetes insipidus	PubMed, Scopus, RCA

Cause of Increases Risk of Balanoposthitis / Balanitis in a Diabetic Patients

In case of uncontrolled diabetes hyperglycaemia and glucosuria, are major consequences apart from this there is decreased humoral and cellular immunity, which most commonly required a medical intervention and these are the factors which increase the susceptibility to infections in patients with uncontrolled diabetes,^[1,9] and consequence that, the proliferation of *Candida* beneath the prepuce.^[10] This is known that *Candida* is a causative agent of less than 20% of all balanoposthitis cases, candida is the most commonly observed pathogen in males with diabetes, habitually this candidiasis presenting as a pruritic rash. The influence of diabetes on the development of with sores, erosions, or papules (with possible sub-preputial discharge).^[11] In males with diabetes some Other predisposing factors causing genital infections are poor hygiene, topical corticosteroid use, pharmacologically induced glucosuria, topical corticosteroid use.^[12] Hyperglycaemic patients whose genital area have moist and warm environment that provides excellent growth conditions for various causative organisms, especially for fungi which is responsible for genital infections.^[13,14] Genital infections in diabetes are often not transmitted sexually and but also pathogens such as *Streptococcus pyogenes*.^[15] Diabetic patients have more prone to develop sexually transmitted infections.^[1,6] An extensive survey on more than 60000 outpatients across the India dermatologist reveals that up to 75% of individuals with *Candida* balanoposthitis were known cases of diabetes mellitus.^[16]

MATERIALS AND METHODS

Study Design

Study carried out at the Darbhanga medical college and hospital, Laheriasarai. On T2DM patients attending the hospital between September 2022 to February 2023 whose treatment is done by resident doctors of DMCH.

Inclusion Criteria

Uncontrolled male diabetic patients who had signs and symptoms of candida's infections like balanoposthitis/balanitis were consented and enrolled in my study.

Exclusion Criteria

Immunocompromised diabetic patients or had chronic illness or admitted in wards and female diabetic patients were not included in this study. Participants were randomly selected and informed consent was obtained as previously described.^[17,18]

Data and Sample Collection

Clinical data were obtained from the consenting participants, as per medical records of age, sex, race, date of detection of diabetes and type of diabetes. According to the United States Centre for Disease Control and Prevention 2014 guidelines [19] blood samples were collected from the recruited participants and send it to lab immediately.

Sample Analysis

Specimens were cultured on Sabouraud dextrose agar (SDA media) for colony counts and *Candida* differential agar for species identification; these cultures were incubated at 37 °C for 24–72 h and checked for growth.[19] The Germ tube test and growth test at 45 °C were performed to distinguish between *C. Albicans* and *C. dubliniensis*. Colonies on sabouraud dextrose agar (SDA) were enumerated and counts above 100000 CFU/ mL were interpreted as overgrowth indicative of infection, based on reviewed literature.^[19,20] Microscopy of wet mount preparation with potassium hydroxide is sufficient for diagnosis. Conversely, positive culture alone is not diagnostic, because fungi may colonize other forms of balanitis. Diabetes type was classified based on diagnostic information on the patient's form into type 1 and type 2 DM.

RESULTS

Among the males, the incidence of *Candida* balanitis is reportedly higher, particularly in uncircumcised men with diabetes.^[6] Globally, approximately 3% of uncircumcised men are affected with *Candida* balanoposthitis.^[21] *C. albicans* is the most common pathogen causing balanitis in men. The majority of the isolates were *C. albicans* (n = 23, 62.2%), followed by *C. glabrata* (n = 7, 18.9%), *C. tropicalis* (n = 3, 8.1%), *Candida dublinensis* (n = 2, 5.4%) and *C. Krusei* (n = 2, 5.4%). In addition, coinfection with other pathogens can worsen the clinical presentation in males with diabetes (not only with common sexually transmitted infections but also pathogens such as *Streptococcus pyogenes*).^[22]

DISCUSSION

Candida spp. Causes balanitis/balanoposthitis in diabetic persons this is well understood relationship of uncontrolled blood glucose levels and the growth of *Candida* beneath the glans penis/prepuce.^[23] While *Candida* is a causative organism of less than 20% of all balanoposthitis cases and present as most commonly observed pathogen in diabetic male patients.it is characterised by redness and swelling

of distal penis and prepuce. it may causes discharge into underpants and dysuria, bleeding from foreskin and glans ulceration.^[24] Preceding association between diabetes and penile infection is cast in population studies as well; for example, the assessment of all male patients with balanoposthitis from the Longitudinal Health Insurance Database in Darbhanga discuss that the incidence of type 2 diabetes mellitus was higher in the balanoposthitis cohort than those without balanoposthitis, with a hazard ratio of 2.55 after age and comorbidity adjustments.^[25]

By dermatologist, a largescale survey done across India, on more than 60000 OPDs, revealed that up to 75% of individual of Candida balanoposthitis were also suffered from diabetes mellitus.^[26]

CONCLUSION

This study showed balanitis/balanoposthitis was high in case of type 2 diabetic patients (particularly in those which have poor glycaemic control). These patients are more vulnerable to urogenital mycotic infections with *C. albicans* and other non-*albicans* Candida species. In males there is also an increased risk of possibility of further complications such as emphysematous cystitis as well as balanitis and balanoposthitis in (primarily uncircumcised) males. Our aim is to introduced appropriate treatment regimen, especially to avoid several complicated conditions, as mentioned above.

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