

## PREVALENCE OF ORAL CANDIDIASIS IN TYPE 2 DIABETIC PATIENTS IN NORTHERN INDIA: AN ORIGINAL RESEARCH

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### ABSTRACT

**Aim-** To study the prevalence of oral candidiasis in type 2 diabetic patients in northern India. **Material and Methods-** 25 type 2 diabetic and 25 non diabetic patients were studied for knowing the presence of oral candidiasis. **Results-** Out of 25 non diabetic patients 10 (40%) patients were found with oral candidiasis. Out of 25 type 2 diabetic patients 19 (76%) patients were found with oral candidiasis. **Conclusion-** Oral candidiasis is more common in older age group individual and also commonly associated with chronic patients of diabetes mellitus. Presence of oral candidiasis significantly correlates with higher patient age group, and longer duration of diabetic illness. Presence of oral candidiasis significantly correlates with higher patient age group, and longer duration of diabetic illness. Presence of oral candidiasis significantly correlates with higher patient age group, and longer duration of diabetic illness. Presence of oral candidiasis significantly correlates with higher patient age group, and longer duration of diabetic illness.

**KEYWORDS:** Type 2 diabetic patients; oral candidiasis.

### INTRODUCTION

The number of people with diabetes has increased from 108 million in 1980 to 422 million in 2014. The overall prevalence of diabetes among adults over 18 years of age has increased from 4.7% in 1980 to 8.5% in 2014 and the World Health Organization (WHO) predicts this will increase to 439 million, almost 10% of adults in 2030.<sup>[1]</sup>

Diabetes Mellitus (DM) is a metabolic disorder which is characterized by the presence of chronic hyperglycemia accompanied to greater or lesser extent by alterations to carbohydrate, protein, and lipid metabolisms due to the decreased insulin secretion or/and disturbed insulin activity.<sup>[1]</sup> Type 2 DM is principally a disease of middle age and elderly. It has both micro vascular and macro vascular complications. In micro vascular complications, cutaneous manifestations are very common and in this group, infections especially fungal are most frequent. Oral candidiasis is a common fungal infection in type 2 diabetics that presents as discrete and confluent white plaques on the buccal mucosa, tongue, and sometimes

the palate, gingivae, and floor of the mouth; these plaques may be wipeable.<sup>[2]</sup> Diabetes mellitus can develop in people of all ages and races, although mostly seen in African-Americans and Hispanics, and prevalence has increased exponentially over the past several decades.<sup>[3]</sup> Diabetes mellitus has a number of oral manifestations. Gingivitis, periodontitis, dry mouth (xerostomia), dental caries, root caries, necrosis of pulp, periodontal abscess, delayed wound healing and burning mouth syndrome. Oral candidiasis is also very common complication of diabetes. A wide range of literature shows that candida albicans is the most frequently encountered candida species in diabetes mellitus. Poor oral hygiene in diabetic patients are prone to increase the level of *Candida*, which is natural habitant of oral cavity and might affect the superficial and systemic fungal infections compared with healthy individuals.<sup>[4]</sup> Two mechanisms are known to be involved in the pathogenesis of oral diabetic complications. Firstly, the polyol pathway converts glucose into the enzyme sorbitol byaldose reductase that causes tissue damage and numerous other diabetic complications. Secondly, the

formation of advanced glycosylation end products (AGE), whose formation results from the binding of glucose to proteins, lipids and nucleic acids, results in the alteration of structures and functions, in addition to its deposition in specific organs that causes various complications.<sup>[5]</sup> Atheroma deposits are formed in cells, which accumulate in the basal membrane and lumen causing decreased cellular defense capacity and impaired polymorphonuclear leukocyte response.<sup>[6]</sup> This makes diabetic patients more susceptible to infection processes especially when caused by anaerobic bacteria due to the reduction of oxygen diffusion through the capillary wall.<sup>[7]</sup>

The oral health care professionals should be able to make the diagnosis of oral candidiasis and provide therapy, but most importantly, the infection's etiology should be identified, which could include a diagnosis of diabetes mellitus. The present study was designed to know the prevalence of oral candidiasis in type 2 diabetic and non-diabetic patients.

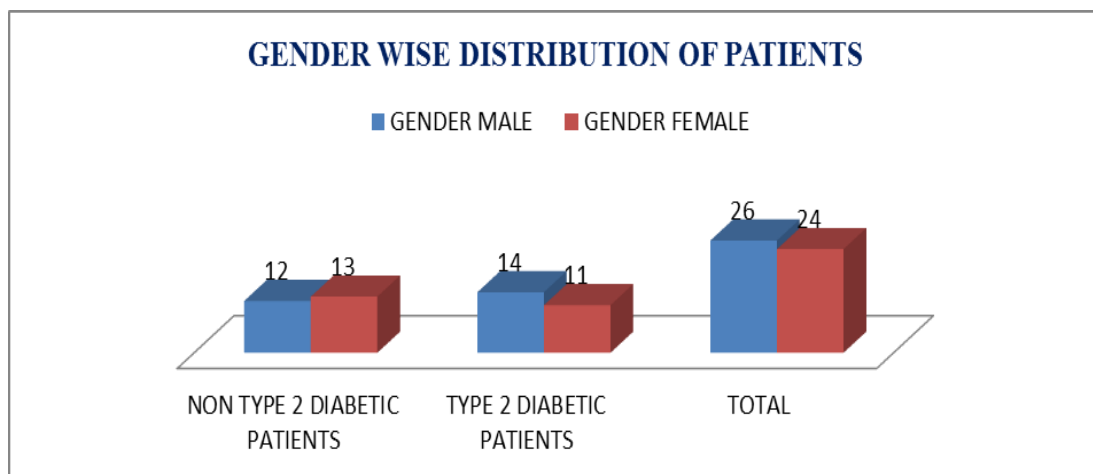
**MATERIAL AND METHODS**

25 non diabetic patients and 25 type 2 diabetic patients were included in this cross sectional study. Patients with diabetic neuropathy, diabetic nephropathy, and diabetic retinopathy were not included in this study. Patients who had used broad spectrum antibiotics, antifungal drugs, alcohol, antiviral drugs and steroids were not included in this study. Pregnant patients and smokers were also excluded from this study. Each patient was supplied with a universal container containing 10ml. of sterile phosphate buffer saline solution (PBS 0.1M pH 7.2). Each patient was asked to rinse mouth. After rinsing the mouth 60 seconds thoroughly, expelled the mouth rinse in to a sterile container. Saliva samples were collected in the MORNING hours between 9am to 1pm and oral rinse was vortex mixed prior to plating. The collected samples were send for further processing. The data were collected regarding the presence of candidiasis. The data thus collected was subjected to statistical analysis.

**RESULTS**

**Table 1: Gender Wise Distribution of Patients.**

Group	Gender				Total	(%)
	Male	Male (%)	Female	Female (%)		
Non Diabetic Patients	12	46.15%	13	54.16%	25	50%
Type 2 Diabetic Patients	14	53.84%	11	45.83%	25	50%
Total	26		24		50	100%

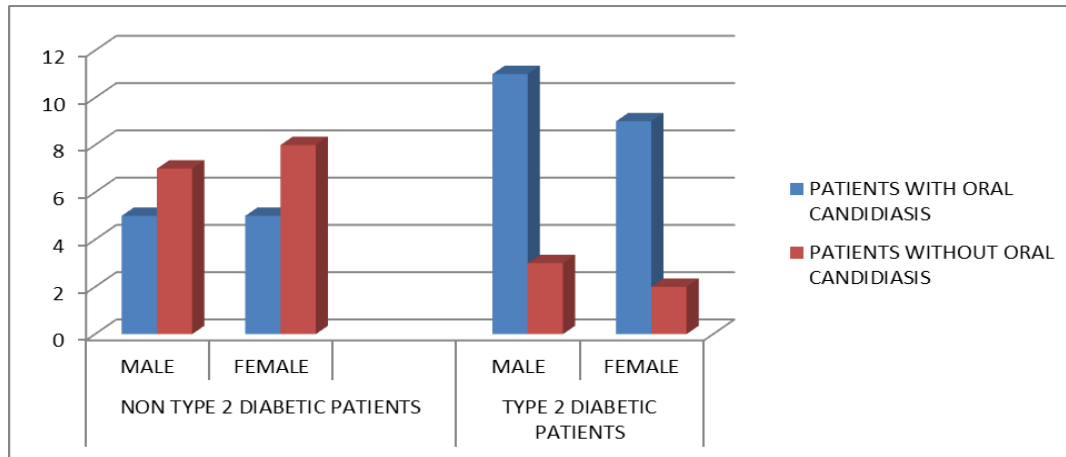


**Graph 1: Gender wise distribution of patients.**

**Table 2: Distribution of oral candidiasis in non-diabetic and type 2 diabetic patients.**

Group	Gender	Patients With OC	(%)	Patients Without OC	(%)	Total	(%)
Non Diabetic Patients	Male	05	16.66%	07	35	12	24%
	Female	05	16.66%	08	40	13	26%
Type 2 Diabetic Patients	Male	11	36.66%	03	15	14	28%
	Female	09	30%	02	10	11	22%
Total		30		20		50	100%

Abbreviation- OC- Oral candidiasis



**Graph 2: Distribution of oral candidiasis in non-diabetic and type 2 diabetic patients.**

25 patients with type 2 diabetes mellitus and 25 non diabetic patients were included in this cross sectional study. Out of 25 type 2 diabetic patients 12 (46.15%) patients were male and 13 (54.16%) patients were female. Out of 25 non diabetic patients 14 (53.84%) patients were male and 11 (45.83%) patients were female. Out of 25 non diabetic patients 10 (40%) patients were found with oral candidiasis. Out of 12 male non diabetic patients 05 patients were found with oral candidiasis and out of 13 female non diabetic patients 05 patients were found with oral candidiasis. Out of 25 type 2 diabetic patients 19 (76%) patients were found with oral candidiasis. Out of 14 male type 2 diabetic patients 11 patients were found with oral candidiasis and out of 11 female type 2 diabetic patients 09 patients were found with oral candidiasis.

## DISCUSSION

Oral candidiasis is an opportunistic infection of the oral cavity; it affects various sectors of the world population irrespective of age or health status. Close to 90% of AIDS patients suffer from oropharyngeal or esophageal candidiasis at some stage of the disease.<sup>[8]</sup> In the general population, carriage rates have been reported to range from 20 to 75% without any symptoms.<sup>[9]</sup> Diabetes is rapidly becoming a major public health problem worldwide. Tapper-Jones et al. have shown that 42% of healthy non diabetics harbor *C. albicans* in their mouths compared to 60% of diabetics<sup>[10]</sup> which is similar to this study (Out of 25 non diabetic patients 10 (40%) patients were found with oral candidiasis and Out of 25 type 2 diabetic patients 19 (76%) patients were found with oral candidiasis). Yarahmadi et al have suggested that 16.2% of the controls and 40.2% of the diabetics carry *C. albicans* in the mouth.<sup>[11]</sup> This study is not similar to present study.

## CONCLUSION

Diabetes mellitus can affect people of all ages, and its prevalence has been increasing worldwide. Providing safe and effective oral medical care for patients with

diabetes requires an understanding of the disease and thorough knowledge of its oral manifestations. The oral health professionals should be aware that prevalence of oral candidiasis is higher in diabetics as compared to non-diabetics. Therefore, they should be able to diagnose the root cause of the condition. The goal of therapy is to promote oral health in patients with diabetes, to help prevent and diagnose diabetes in dental patients receiving routine oral care and to enhance the quality of life for patients.

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