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Research Article

**A RESEARCH ON THE INCIDENCE OF TYPE II DIABETES  
MELLITUS (T2DM) IN PATIENTS AND ORAL-MUCOSAL  
ALTERATIONS PREVALENCE**<sup>1</sup>Dr. Khaula Younus, <sup>2</sup>Ahmad Hassan, <sup>3</sup>Ijaz Ali<sup>1</sup>Lahore General Hospital<sup>2</sup>MO, BHU Chak No. 63-DB, Bhakkar<sup>3</sup>MO, RHC Haiderabad Thal, Bhakkar**Abstract:**

**Objective:** The purpose of this study is to know about the link between the changes in the mucus membranes of mouth and the diabetes caused by the deficiency of the amount of insulin.

**Methods:** This research was carried out at Allied Hospital, Faisalabad (December, 2016 to November, 2017). Eight hundred subjects were the participants of the study. Three hundred and ninety-five patients were suffering of diabetes and four hundred and five participants were the healthy people being used as controls. The medical check up of oral cavity was performed for the all participating members of the research with the help of a mirror, bleached cotton and in the presence of moderate light.

**Results:** The high occurrence of the abnormal structural change of the mucus membranes was great considerably greater than 0.0001. The odd ratio was found as 2.601 and confidence level was 1.9293.509 in the sufferers of the diabetes in comparative to the healthy controls. With relation to the abnormal structure change in the mucus membranes located in oral cavity, high remarkable alliance p was greater than 0.0001. The odd ratio was 4.275 and the confidence level was from 2.798 to 6.534 was discovered in the tongue with diabetes. The outcome of this study does not provide any link between the diabetes due to the deficiency of insulin and wicked abnormalities.

**Conclusion:** This research proved that the high amount of occurrence of abnormal structural changes in the mucus membranes of the oral cavity were in large quantity in the people suffering of diabetes than the healthy people. This research gave the exact information about the unhealthy effects of the diabetes on the functioning of the oral cavity.

**Key Words:** Mucus, membrane, oral, abnormal, insulin, diabetes, controls, bleached cotton.

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**INTRODUCTION:**

The infections in the oral cavity have very bad effects on the QOL (quality of life). The quality of the life has a dangerous influence on the economic condition, social dealings and happiness of the individuals [1]. The infections of the oral cavity are often resulted in loss of life. The oral diseases minimize the good condition of health and good health of oral cavity promotes QOL [2].

Diabetes due to the deficiency of the insulin is acknowledged as a set of metabolic abnormalities categorized by abnormal high blood sugar, low amount of the insulin, loss of functioning of insulin or both [3]. Diabetes is a global health problem affecting a large number of people in the world. The quantity of the sufferers of diabetes is increasing day by day due to increase of population, age factor, fatness and the loss of the rural areas due to urbanization [4].

It is documented fact that the quantity of the sufferers of diabetes mellitus which was one hundred and seventy-one million in 2000 will reach to three hundred and sixty-six million in year 2030 [5]. The occurrence of diabetes mellitus in our country Pakistan is twelve percent in subjects over twenty-five years old.

It is not an astonishing factor due to the availability of the danger factors for diabetes mellitus in our country Pakistan. The amount of the people suffering of diabetes mellitus in Pakistan was more than five million in 2000. It is predicted that this amount will increase up to fourteen million by 2030 [5].

The poor health conditions are the early difficulties faced by the sufferers of diabetes. These difficulties can be caused due to the swollen of some parts of the throat or other related diseases [6]. Researchers have proved that diabetes due to the lack of insulin is the cause of many other diseases as several tongue abnormalities, inflammation of the mucus membrane, gums and teeth diseases and inflammation of the gums [7, 8]. The oral diseases are caused by the bacteria and fungi which are lead by diabetes [9].

Some research works declared the high amount of the occurrence of change of abnormal structure of mucus membrane in the patients of diabetes mellitus [11, 12]. But those studies do not prove that the change in the abnormal structure of the mucus membrane in the oral cavity in the patients of diabetes mellitus happen commonly than the other persons not suffering from diabetes mellitus [13, 14]. The main purpose of this

study was to know about the link between the change in the mucus membrane of the oral cavity and diabetes.

**METHODS:**

This research was carried out at Allied Hospital, Faisalabad (December, 2016 to November, 2017). The review board of the ethical committee gave his approval for the study. The patients of the diabetes were enrolled from the diabetes institute and controls of healthy people were included from medical university. The method of this research was cross sectional. The participants of this research were four hundred and five healthy members and three hundred and ninety-five were the patients of diabetes.

All the subjects of the study underwent a medical interrogation of the mucus membrane of the oral cavity. Breached cotton, efficient light source and a mirror were used for the examination of the oral cavity. The examination of the liquid and fluids of this cavity was also carried out for the discovery of this disease but it was not compulsory to do so. The changes of the mucosal in oral cavity are divided into two types; one is Benign Oral Mucosal Lesions abbreviated as BML and the second one is Potentially Malignant Disorders which is abbreviated as PMDs. BML structural abnormalities contained a discovery and rectification of tongue, a narrow depression in the surface of tongue and area wise tongue. PMDs included eruptive skin diseases, patches of keratosis on the mucous membranes and other malignant disorders.

This research includes the early discovered patients whose were under treatment of diabetes with having no other difficulty. Participants were thoroughly checked by doctors as have any other serious complication in the disease of diabetes. The blood sugar of all the participants was checked and same social status and age people with no other related major disease were selected for the research.

The abnormalities related to the immunity system are linked with the eruption of papules like colitis, hepatitis and myasthenia. Patients of first type diabetes were also excluded. Special type software was used for the calculation of the sample size which is being used in WHO. For the collection and entry of data, special software SPSS was used. Chi square test was being used to determine the link between the diabetes and changes in the structural abnormalities of the mucus membrane located in oral cavity.

**RESULTS:**

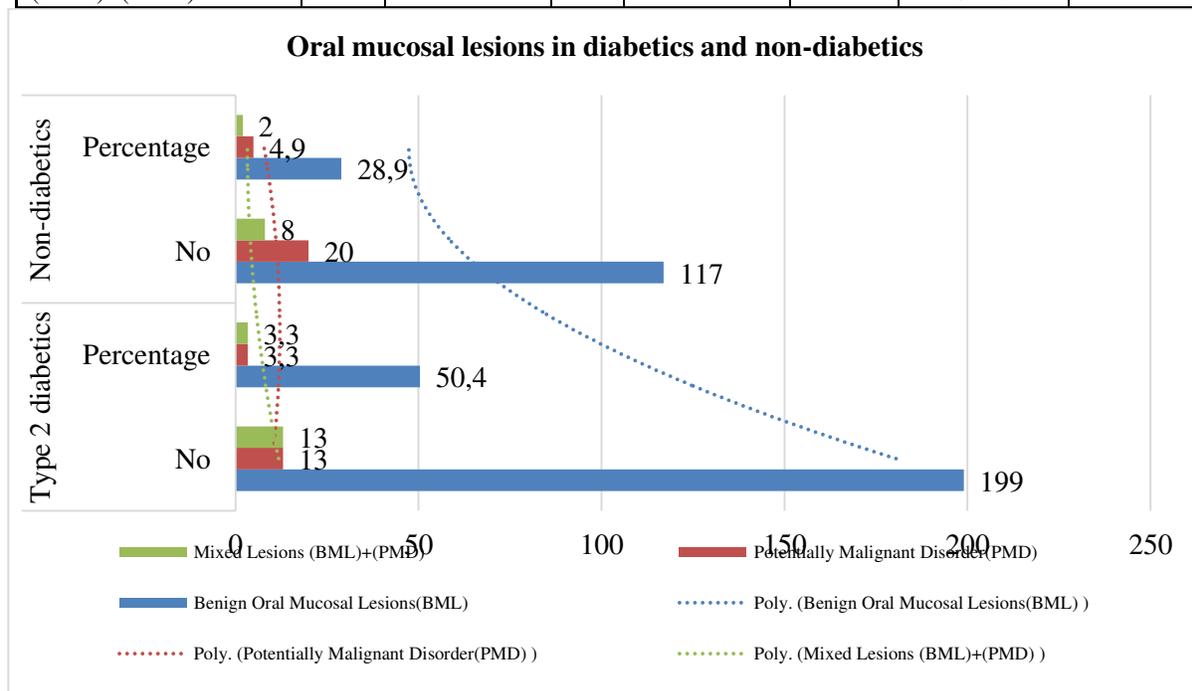
There were total eight hundred participants. Four hundred and eighty-two were the male participants and three hundred and eighty-two were the female members who went under medical assessment. The average age of the males was fifty-one years and the average age of females was forty-nine years. Among three hundred and ninety-five diabetes mellitus patients, about fifty-four percent were men and forty-

six percent were women. Among four hundred and five controls, males were more than sixty-six percent and females were more than thirty-three percent. The occurrence of abnormal structural change in the mucus membrane of oral cavity was very high in the patients of DM as compared to the healthy controls as mentioned in table number one.

Detailed outcomes have been outlined in the given tables.

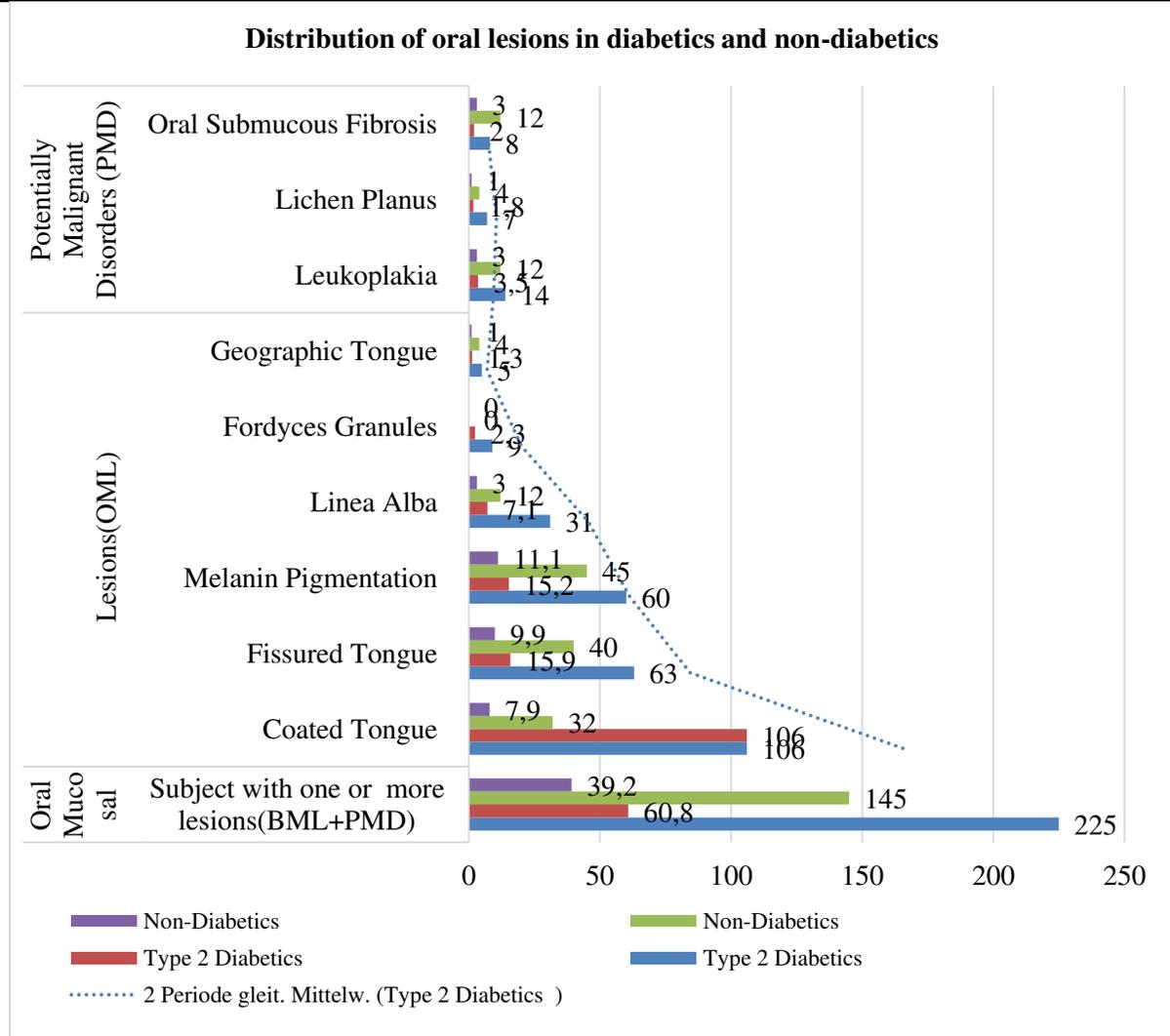
**Table – I:** Oral mucosal lesions in diabetics and non-diabetics

Oral Mucosal Lesions	Type 2 diabetics		Non-diabetics		Odds Ratio	Confidence Interval	P-Value
	No	Percentage	No	Percentage			
Benign Oral Mucosal Lesions(BML)	199	50.4	117	28.9	2.601	1.929 - 3.509	<0.0001
Potentially Malignant Disorder(PMD)	13	3.3	20	4.9	0.994	.482 - 2.052	0.987
Mixed Lesions (BML)+(PMD)	13	3.3	8	2	2.485	1.009 - 6.123	0.048



**Table – II:** Distribution of oral lesions in diabetics and non-diabetics

Variables		Type 2 Diabetics		Non-Diabetics		Odds ratio	95% Confidence Interval	p-value
		No	%	No	%			
Oral Mucosal	Subject with one or more lesions(BML+PMD)	225	61	145	39	2.53	1.901-3.366	<0.0001
Lesions(OML)	Coated Tongue	106	106	32	7.9	4.275	2.798-6.534	<0.0001
	Fissured Tongue	63	16	40	9.9	1.732	1.134-2.644	0.011
	Melanin Pigmentation	60	15	45	11	1.433	0.947-2.168	0.089
	Linea Alba	31	7.1	12	3	2.789	1.411-5.513	0.003
	Fordyce’s Granules	9	2.3	0	0			
	Geographic Tongue	5	1.3	4	1	1.285	0.343-4.822	0.71
Potentially Malignant Disorders (PMD)	Leukoplakia	14	3.5	12	3	1.203	0.550-2.635	0.643
	Lichen Planus	7	1.8	4	1	1.809	0.525-6.227	0.348
	Oral Sub mucous Fibrosis	8	2	12	3	0.677	0.274-1.674	0.399



**DISCUSSION:**

The linkage of the diabetes as a dangerous aspect for the oral complications is discussed in many research works [15, 16]. In this research, the occurrence of the changes of the mucus membrane in the oral cavity is high in diabetes sufferers than the healthy ones. This result can be linked to the low amount of flow of saliva which reduces the cleaning ability of the tongue. Another study of one hundred and forty-six patients of diabetes mellitus also found with occurrence of twenty-nine percent of coated tongue [17].

A link between the narrow depression in the tongue and diabetes is also concluded in other works [18]. Another research also found the same result with tongue problems in the diabetes patients [17]. The current research did not find any link between the diabetes and PMDs. A link was found in the Keralite women of India [18].

The high occurrence of the Patches of keratosis on the mucous membranes in the oral cavity was only less than four percent in the diabetes sufferers. There was not any important disparity between diabetes patients and the controls. The high ratio of the Patches of keratosis on the mucous membranes in the oral cavity is due to the large amount of the smokers in the above research [19].

The occurrence of the oral diseases is very high in South part of the East Asia. Karachi is the world most notorious area due to the highest rates of cancers of the oral cavity [26].

**CONCLUSION:**

The occurrence of the changes due to the abnormal condition of the mucus membrane in the oral cavity was high in the diabetes patients than the controls of healthy people. No special link was discovered between the mucosal disorders and this type of the diabetes.

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