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PREVALENCE OF PERIAPICAL ABSCESS IN DIABETICS AMONG LOCAL POPULATION OF PAKISTAN

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Abstract:

Introduction: *Dental morbidities associated with diabetes mellitus (DM) include an increased prevalence of periodontal diseases (PDs).* ***Objectives:*** *The main objective of the study is to analyse the prevalence of periapical abscess in diabetics among local population of Pakistan.*

Material and methods: *This descriptive study was conducted in Jinnah Post Graduate Medical Centre, Karachi during March 2019 to July 2019. Blood pressure was measured using an automated digital blood pressure monitor in the lying position with the average of three readings was recorded. Weight in kilograms and height in metres was recorded and used to calculate BMI.*

Results: *In all, 200 participants were found to be currently diabetic, giving an overall prevalence of current condition to be 24.6% (95% CI 21.90 - 27.49) in the study population. History of disease was reported by 31.5% participants (P < 0.001).*

Conclusion: *Microvascular complications tend to occur in those diabetic patients who have long duration of the disease, hypertension and poor glycemic control.*

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INTRODUCTION:

Dental morbidities associated with diabetes mellitus (DM) include an increased prevalence of periodontal diseases (PDs). However, the occurrence of periapical infections in DM has not been sufficiently documented in the literature. Diabetes mellitus is characterized by an inadequate carbohydrate, lipidic and protein metabolism, its primary aspect is hyperglycemia. This hyperglycemia acts as the main cause of incidence and progression of microvascular complication associated with the disease (retinopathy, nephropathy and neuropathy) [1]. In its ethiopathogenesis, influences a complex interaction of genetic and environment factors, establishing different causes of hyperglycemia. Among the factors associated to hyperglycemia are: differences in insulin secretion, lower glucose uptake or higher glucose production [2]. In the present time, it is known that the progressive defect in insulin production due to insulin resistance represents 90–95% of all individuals with diabetes mellitus type 2 (DM2) [3]. DM2 is considered a XXI century epidemic, not only for its magnitude but for its repercussions in cardiovascular disease, and is the main cause of death in developed societies.

Pakistan is a South Asian country with an area of 796 095 km^2 and a population of 207.7 million people. In terms of population, Pakistan is the sixth most populous country and is the 36th largest country by geographical area in the world. Before 2018, the only previous national diabetes survey in Pakistan in 1999 (published in 2007), reported the prevalence of type 2 diabetes as 11% using the oral glucose tolerance test (OGTT). Part of the same survey separately reported the prevalence of type 2 diabetes in different provinces of Pakistan[4]. The International Diabetes Federation (IDF) reported in its Atlas 5th edition the prevalence for Pakistan to be 6.8%, aged 20–79 years, but healthcare professionals with local insight always believed this to be an underestimate. Subsequently, there were conflicting findings with prevalence ranging from7.2% to 19.21% in different regions of the country [5].

The American Diabetes Association (ADA) criteria for the diagnosis of diabetes require either fasting plasma glucose (FPG) or 75 gm OGTT, which is time-consuming, requires fasting and may not always be reproducible. In 2009, the International Expert Committee on diabetes proposed new diagnostic criteria based on glycated haemoglobin (HbA1c), which captures chronic glucose exposure[6].

Objectives:

The main objective of the study is to analyse the prevalence of periapical abscess in diabetics among local population of Pakistan.

MATERIAL AND METHODS:

This descriptive study was conducted in Jinnah Post Graduate Medical Centre, Karachi during March 2019 to July 2019. Blood pressure was measured using an automated digital blood pressure monitor in the lying position with the average of three readings was recorded. Weight in kilograms and height in metres was recorded and used to calculate BMI.

Diabetes status was assessed for HbA1c on blood samples, traceable to diabetes control and complication trial (DCCT) reference method. To compare the results from HbA1c, 2-hour OGTT was conducted on a random sample of participants from all clusters in the specified standard laboratory. Participants were given vouchers for free OGTT test within 7 days in a nearby laboratory.

The data was collected and analysed using SPSS version 19. All the values were expressed in mean and standard deviation.

RESULTS:

In all, 200 participants were found to be currently diabetic, giving an overall prevalence of current condition to be 24.6% (95% CI 21.90 - 27.49) in the study population. History of disease was reported by 31.5% participants ($P < 0.001$).

Table 01: Distribution of participants according to disease

Status	Total (%)	P-value
Diabetic	24.6	<0.001
Type-2	32	<0.001
Non diabetic	68.5	<0.001

In our study, microvascular complications were present in 385 (77%) patients (Table 2).

Table 02: Characterizes the microvascular complications in Diabetes.

HbA1c	Patients	Percentage
<7.0%	95	83
>7.0%	20	17
Total	115	100

95 (83%) patients of the 115 patients without microvascular complications of had HbA1c < 7.0 (Table 5). 80 (70%) patients of the115 patients without microvascular complications had duration < 5 years (table 03).

Table 03. Differentiates patients based on HbA1c (hemoglobin A1c). Patients without microvascular complications.

Duration of Diabetes	No. of Patients	Percentage
< 5 years	80	70
> 5 years	35	30
Total	115	100

DISCUSSION:

The most important pathogenesis leading to microvascular damage is that hyperglycemia damages capillary endothelial cells in the retina, mesangial cells in the renal glomeruli and Schwan cells of the peripheral [7-10]. Due to hyperglycemia, there is excess glucose transport in these endothelial cells which leads to damage of these cells. Thus, microvascular complications arises as a result of damage inside these endothelial cells.

Current evidence does support direct relationship between hypertension and poor glycemic control with microvascular complications as also seen in our study[11]. These are termed as independent risk factors for microvascular disease progression. Age, glycated hemoglobin, duration of diabetes, and serum triglycerides are other risk factors as well as smoking, obesity, physical inactivity[12].

Limitations:

The limitation of our study is that it is retrospective observational study but it does validate the findings of those few studies that are available in the literature, which have shown poor glycemic control and hypertension to be associated with microvascular complications of diabetes.

CONCLUSION:

Microvascular complications tend to occur in those diabetic patients who have long duration of the disease, hypertension and poor glycemic control.

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