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Research Article

**ANALYSIS OF LEVEL OF BLOOD GLUCOSE IN DIABETIC
PATIENTS UNDERGOING DENTAL PROCEDURES IN
PAKISTANI POPULATION**Dr. Numra Asif¹, Maham Rasool¹, Ahmed Mehmood²¹MO at DHQ/UTH Gujranwala, ²Holy family Hospital, Rawalpindi.**Abstract:**

Introduction: Majority of the systemic diseases evidently present oral symptoms and Diabetes Mellitus (DM) is not an exception. Persons with diabetes are at an increased risk of developing oral conditions such as gingivitis, periodontal disease, and alveolar bone loss, which has been associated with persistent poor glycemic control.

Objectives: The basic aim of the study is to find the level of blood glucose in diabetic patients undergoing dental procedures among local population of Pakistan.

Material and methods: This study was conducted at DHQ hospital Gujranwala, during June 2018 to December 2018. The patients selected for this study were those who suffered from diabetes. The sample included only the patients who presented blood glucose levels and HbA1c demonstrating that diabetes was under control. They should also be under continuous oral hypoglycemic drugs treatment, medical supervision and no dose alterations.

Results: There is no statistically significant difference between the groups, regarding the evaluation period ($p > 0.05$). However, when comparing the periods statistically significant differences were observed ($p < 0.05$) for T2 and T3 values for group. For heart rate, there was no statistically significant difference between the groups regarding the evaluation period ($p > 0.05$). However, regarding the comparison between the periods statistically significant differences were observed ($p < 0.05$) for the T1 and T2 values for group.

Conclusion: It is concluded that periodontal disease is the main oral clinical manifestation in diabetic patients. The anxiety level of patients neither varied significantly nor showed any correlation with the investigated hemodynamic parameters and glucose levels, regardless of whether local anesthetics were used.

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INTRODUCTION:

Majority of the systemic diseases evidently present oral symptoms and Diabetes Mellitus (DM) is not an exception. Persons with diabetes are at an increased risk of developing oral conditions such as gingivitis, periodontal disease, and alveolar bone loss, which has been associated with persistent poor glycemic control. Under most circumstances, it is impossible to provide effective dental care without the use of local anesthetics and vasoconstrictors. Although these drug classes have a history of safety and efficacy, they have the potential to produce significant toxicity if used carelessly. Whereas local anesthetics produce peripheral vasodilatation, which contributes to hypotension, even small doses of vasoconstrictors can influence cardiovascular function, causing an increase in cardiac output and stroke volume as well as alterations in heart rate and arterial blood pressure [1]. Diabetes mellitus, a world-wide increasing disease, is related to a heterogeneous group of metabolic disorders characterized by hyperglycemia resulting from either defects in secretion or insulin action or even both. Many of the patients who seek dental care present systemic diseases, including diabetes, which are often unknown and not controlled. For these risk patients, thorough anamneses are recommended in order to recognize their biological conditions and establish the clinical risks during the intervention. Moreover, the most critical the patient's systemic condition, the more important is the effective anxiety and pain control [2].

The successful use of local anesthesia is essential for good dental treatment as well as dentist and patient interaction in order to help anxious or dental phobic patients to achieve confidence. When pain is unexpectedly caused, there may be significant physiological changes during the dental procedures. With the evolution of local anesthetic solutions, their efficacy and clinical safety have been improved [3]. Nevertheless, there is still the possibility of systemic complications due to accidental intravascular injection, anesthetic inadequate choice, anesthetic overdose of salt or vasoconstrictor, unwanted drug interactions and more rarely, methemoglobinemia. Tooth extraction is one of the most common and frequent dental procedures, which is considered a

stressful and painful intervention [4]. If patients' pain can be soothed, therapeutic procedures will be carried out in a more acceptable situation and patients' pain threshold will increase. Lidocaine is the most common local anesthetic material in dentistry [5]. Lidocaine was introduced by Nils Lofgren in 1943 and used for the first time as a local anesthetic material in 1948 [6].

Objectives

The basic aim of the study is to find the level of blood glucose in diabetic patients undergoing dental procedures among local population of Pakistan.

MATERIAL AND METHODS:

This study was conducted at DHQ hospital Gujranwala, during June 2018 to December 2018. The patients selected for this study were those who suffered from diabetes. After the volunteers signed the consent form, a small sample of blood from the fingertip was taken and placed in the digital glucometer. The sample included only the patients who presented blood glucose levels and HbA1c demonstrating that diabetes was under control. They should also be under continuous oral hypoglycemic drugs treatment, medical supervision and no dose alterations. Blood pressure was measured using a digital sphygmomanometer and pulse oximetry and heart rate measured by pulse oximetry. The data were tabulated and statistically analyzed by means of Friedman and Wilcoxon tests, with level of significance of 5%.

Statistical analysis

Student's t-test was performed to evaluate the differences in roughness between groups. Two-way ANOVA was performed to study the contributions. A chi-square test was used to examine the difference in the distribution of the fracture modes (SPSS 19.0 for Windows, SPSS Inc., USA).

RESULTS:

There is no statistically significant difference between the groups, regarding the evaluation period ($p > 0.05$). However, when comparing the periods statistically significant differences were observed ($p < 0.05$) for T2 and T3 values for group.

Table 01: Mean values and standard deviation of blood glucose (mg / dL) in the groups

Groups	T1	T2	T3	P values
G1	147.65 ± 40.18	149.9 ± 44.75	137.85 ± 35.86	*0.0425
G2	142.35 ± 34.83	144.1 ± 35.06	137.55 ± 38.66	0.0517
<i>P values</i>	0,3760	0,8813	0,9256	

For heart rate, there was no statistically significant difference between the groups regarding the evaluation period ($p > 0.05$). However, regarding the

comparison between the periods statistically significant differences were observed ($p < 0.05$) for the T1 and T2 values for group.

Table 02: Mean values and standard deviation of heart rate (bpm)

Groups	T1	T2	T3	P values
G1	73.00 ± 12.47	77.90 ± 12.63	74.75 ± 13.03	* <0.05
G2	75.45 ± 12.49	77.35 ± 11.56	73.75 ± 11.86	0.5842
<i>P values</i>	0.4209	0.9108	0.3144	

DISCUSSION:

Most types of dental treatment can produce discomfort and pain at some level. Further, pain may influence or be influenced by anxiety levels related to dental treatment. The use of a LAVA (injection) can also produce extreme pain and fear, at least momentarily, in some patients. On the other hand, when a dentist judges that it is possible to go on with a procedure without the use of a LAVA, patients may also exhibit discomfort, anxiety, and pain. An ineffective form of pain control increases the risk of negative patient health outcomes due to increased levels of endogenous catecholamines, particularly norepinephrine, which may increase blood pressure and heart rate [7]. The purpose of this study was to determine if there was a significant correlation between anxiety levels, hemodynamics, and glucose parameters in patients undergoing dental treatment, regardless of whether or not they received a LAVA. No such relationship was found. Diabetes mellitus (DM) is one of the most frequent pathologies that dentists encounter. Its clinical importance springs from the possible occurrence of acute complications, whose severity could mean an immediate risk for the diabetic patient's life and require urgent diagnosis and treatment. DM includes a group of diseases characterized by impaired action or secretion of insulin, or both. There are four etiologic types of diabetes, although the most frequent are type 1 (90%) [8]. Prevalence of diabetes in adults worldwide was estimated to be 4% in 1995, and is predicted to rise to 5.4% by the year 2025. The countries with the largest number of people with diabetes are India, China and the U.S. In developing

countries, the majority are in the age range of 45–64 years. In the developed countries, the majority of people with diabetes are aged 65 years. There are more women than men with diabetes. Besides that there was no statistically significant difference in blood glucose levels of patients undergoing both treatments suggesting the clinical feasibility of epinephrine or felypressin administration for patients with this profile [9]. The results of this study corroborate with Haji et al. and Khawaja et al. showing that the use of lidocaine associated to epinephrine does not present significant difference in the blood glucose alterations for compensated diabetic patients [10].

CONCLUSION:

It is concluded that periodontal disease is the main oral clinical manifestation in diabetic patients. The anxiety level of patients neither varied significantly nor showed any correlation with the investigated hemodynamic parameters and glucose levels, regardless of whether local anesthetics were used. Poorly controlled diabetes could lead to complications that may even be life-threatening. Long-term complications include: retinopathy, nephropathy, autonomic neuropathy, peripheral neuropathy and cardiovascular disease.

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