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Research Article

**ANALYSIS OF BLOOD GLUCOSE CONCENTRATION IN  
DIABETIC PATIENTS UNDERGOING TOOTH EXTRACTION**<sup>1</sup>Dr. Anam Khalid, <sup>1</sup>Dr. Nida Jaleel, <sup>2</sup>Dr. Mehtab Ahmad<sup>1</sup>Punjab Dental Hospital, Lahore<sup>2</sup>Dental Surgeon at RHC Mandi Sadiq Ganj, Bahawalnagar**Abstract:**

**Introduction:** 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. **Aims and objectives:** The basic aim of the study is to find the level of blood glucose concentration in diabetic patients undergoing tooth extraction. **Material and methods:** This study was conducted at Punjab dental hospital, Lahore during 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. **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. **Conclusion:** It is concluded that periodontal disease is the main oral clinical manifestation in diabetic patients. 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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**INTRODUCTION:**

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 [1].

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 [2]. 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 [3]. 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 [4]. Lidocaine was introduced by Nils Lofgren in 1943 and used for the first time as a local anesthetic material in 1948. One of the most important concerns about local anesthetic injection is its systemic effects [5].

The most common complications after lidocaine injection are vasovagal shock, hyperventilation syndrome, tachycardia, shivering, and the loss of consciousness. Injection procedures cause pain and induce secretion of endogenous catecholamine, which could have a synergism effect with the vasoconstrictors in the local anesthetic material, leading to some side effects. Using epinephrine along

with local anesthesia can also induce metabolic changes [6].

**Aims and objectives**

The basic aim of the study is to find the level of blood glucose concentration in diabetic patients undergoing tooth extraction.

**MATERIAL AND METHODS:**

This study was conducted at Punjab dental hospital, Lahore during 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. xclusion criteria consisted of volunteers presenting blood pressure levels higher than 140x90mmHg or a history of hypersensitivity to the anesthetic solutions used in the research. The clinical procedure was performed and its duration was timed and recorded. The second assessment of the blood glucose level was performed 10 minutes after anesthesia (T2) and the third after 20 minutes (T3). 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
P values	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
P values	0.4209	0.9108	0.3144	

### DISCUSSION:

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%) [7]. 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 [8]. 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 [9]. In addition, Santos-Paul et al. conducted a study and demonstrated that epinephrine associated to lidocaine did not lead to hyperglycemia significant changes either in hemodynamics or in anxiety parameters in type 2 diabetic and coronary disease patients. Other studies have also observed the safe use of epinephrine as a vasoconstrictor in these patients [10].

### CONCLUSION:

It is concluded that periodontal disease is the main oral clinical manifestation in diabetic patients. 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.

### REFERENCES:

- Mandel L, Patel S. Sialadenosis associated with diabetes mellitus: a case report. *J Oral Maxillofac Surg.* 2002;60:696-8
- Nobre F, Giorgi DM. Diagnóstico e classificação. *Diretrizes Brasileiras de Hipertensão VI. Rev Hipertensão.* 2010;13(1):12-19.
- Santos-Paul MA, Neves IL, Neves RS, Ramires JA. Local anesthesia with epinephrine is safe and effective for oral surgery in patients with type 2 diabetes mellitus and coronary disease: a prospective randomized study. *Clinics.* 2015;70(3):185-9. doi: 10.6061/clinics/2015(03)06
- Andrade ED, Ramacciato JC, Motta RHL. Interações medicamentosas adversas. In: Andrade ED. *Terapêutica medicamentosa em Odontologia.* 3a ed. São Paulo: Artes Médicas; 2014, p. 78-91.
- Khawaja NA, Khalil H, Parveen K, Alghamdi AM, Alzahrani RA, Alherbi SM. An influence of adrenaline (1:80,000) containing local anesthesia (2% Xylocaine) on glycemic level of patients undergoing tooth extraction in Riyadh. *Saudi Pharm J.* 2014 Dec;22(6):545-9.
- American Diabetes Association. Diagnosis and

- classification of diabetes mellitus. *Diabetes Care*. 2010 Jan;33(Suppl 1):S62-9.
7. Malamed SF. Knowing your patients. *J Am Dent Assoc*. 2010 May;141(Suppl 1):3S-7S. doi: 10.14219/jada.archive.2010.0350
  8. Caldas CS, Bergamaschi CC, Succi GM, Motta RHL, Ramacciato JC. Clinical evaluation of different ephinephrine concentration for local dental anesthesia. *Rev Dor*. 2015 jan-mar;16(1):1-5.
  9. Palmer-Bouva C, Oosting J, deVries R, Abraham-Inpijn L. Stress in elective dental treatment: epinephrine, norepinephrine, the VAS, and CDAS in four different procedures. *Gen Dent*. 1998 Jul-Aug;46(4):356-60.
  10. Gortzak RA, Oosting J, Abraham-Inpijn L. Blood pressure response to routine restorative dental treatment with and without local anesthesia: continuous noninvasive blood pressure registration with a finger manometer. *Oral Surg Oral Med Oral Pathol*. 1992;73(6):677-81.
  11. Brand HS, Gortzak RA, Palmer-Bouva CC, Abraham RE, Abraham-Inpijn L. Cardiovascular and neuroendocrine responses during acute stress induced by different types of dental treatment. *Int Dent J*. 1995 Feb;45(1):45-8.