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Original Research

A study to analyse Blood pressure variations in patient undergoing tooth extraction

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***ABSTRACT*:**
Background: Dental extraction is one of the most common procedure in dentistry. It usually induces fear, phobia and anxiety in patients. Anxiety is one of the stated aspects that usually causes discomfort to both healthcare professional and patient. Another frequent complication of dental treatments are the occurrence of cardiovascular changes, which are usually harmless in healthy subjects, but can be harmful in those with previous pathology, especially in the case of heart disease. **Objectives:** To assess the variations in Blood Pressure among the patients undergoing Dental Extraction. **Methodology:** The study randomly selected 100 patients, both genders aged between 14 and 65 years-old, who were referred for tooth extraction during the period of October 2017 to October 2018 in KIM'S Dental college Amalapuram, Andhra Pradesh. The systolic and diastolic blood pressure were measured (in mmHg), at four different moments: waiting room, ten minutes prior to the treatment (M1), five minutes after the application of the anesthetic (M2), after tooth extraction (M3) and after suture (M4). **Results:** Comparing the systolic measurements between two different moments, only at M1 and M4 there were no statistically significant differences ($p > 0.05$). Concerning to the diastolic measurement, the highest mean was seen at M4, followed by M1, M3 and M2. Comparing these moments, at two comparisons there were no statistically significant differences: M1xM4 ($p > 0.05$) and M2xM3 ($p > 0.05$). **Conclusion:** There was a variation in BP of patients undergoing dental extractions at different moments. This increase is related to fear and anxiety during dental care.
Key words: Dental, extraction, hypertension, anxiety.

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INTRODUCTION:

Dental extraction is one of the most common procedure in dentistry. It usually induces fear, phobia and anxiety in patients. Anxiety is one of the stated aspects that usually causes discomfort to both healthcare professional and patient. However, with proper technique, the complications are minimal. According to Medeiros et al., negative previous experiences, whether direct or indirect, may be the main reasons of fear and anxiety during dental treatment.[1]

Excessive bleeding after a dental extraction is a most common complication. Another frequent complication of dental treatments are the occurrence of cardiovascular changes, which are usually harmless in healthy subjects, but can be harmful in those with previous pathology, especially in the case of heart disease.[2] Risk for the patient is anticipated with the measurement of blood pressure and cardiac frequency. Most studies indicate that both parameters combined can serve as good indicators of stress. With respect to routine interventions, such as dental extraction, it is rare to monitor the vital signs of healthy patients or to perform blood tests. However, some studies have linked the changes in vital signs with possible stress and the use of anesthetics.[3,4]

Depending on the level of anxiety, some individuals may experience a rise in blood pressure (BP), especially in those who have systemic changes associated with psychological factors.[5] Nerve stimulation is one of the factors causing BP elevation.

Anaesthesia also causes a state of stress in the patient, thus affecting blood pressure. During stress, there is an increase in the release of cortisol by stimulation of the adrenal cortex and the stimulation of the adrenal medulla by the autonomic nervous system, and this in turn releases endogenous catecholamines, epinephrine

and norepinephrine in an amount 40 times higher than the level at rest, causing faster heart rate, elevation in the systolic volume of the heart and the constriction of the vascular bed, thereby increasing both systolic and diastolic pressures.[6-9]

Therefore, it is important for the dentists to routinely measure blood pressure in patients prior to procedures, especially surgical in order to avoid possible complications such as hypertensive crises that can cause rapid heartbeat, sweating, mydriasis, pulmonary hyperventilation, agitation and increased arterial pressure.[5,6,10] This study was aimed at assessing the variations in blood pressure in patients undergoing dental extraction.

Objectives:

To assess the variations in Blood Pressure among the patients undergoing Dental Extraction

MATERIALS AND METHODS:

The study randomly selected 100 patients, both genders aged between 14 and 65 years-old, who were referred for tooth extraction during the period of October 2017 to October 2018 in KIM'S Dental college Amalapuram, Andhra pradesh

Inclusion criteria

- Referral for at least one tooth extraction and good general health

Exclusion criteria

- On anticoagulant and/or antiplatelet drugs for the last six months
- pregnant women
- presenting pericoronitis
- hepatic dysfunction
- uncontrolled diabetes mellitus and hypertension
- using substances capable of altering blood pressure

Informed written consent was taken from all the patients and measurements executed by single examiner. The systolic and diastolic blood pressure were measured (in mmHg), at four different moments: waiting room, ten minutes prior to the treatment (M1), five minutes after the application of the anesthetic (M2), after tooth extraction (M3) and after suture (M4).

RESULTS:

By evaluating the data of systolic measurements, the highest mean was at M4 followed by M1, M3 and M2. Comparing the systolic measurements between two different moments, only at M1 and M4 there were no statistically significant differences ($p > 0.05$). At the other measurements, there were statistically significant differences between M1 and M2 ($p < 0.001$), M1 and M3 ($p < 0.001$), M2 and M3 ($p < 0.01$), M2 and M4 ($p < 0.001$) and M3 and M4 ($p < 0.001$). The value of $p < 0.0001$ is considered as extremely significant.

Concerning to the diastolic measurement, the highest mean was seen at M4, followed by M1, M3 and M2. Comparing these moments, at two comparisons there were no statistically significant differences: M1 and M4 ($p > 0.05$) and M2 and M3 ($p > 0.05$). At the other comparisons, there were statistically significant differences between M1 and M2 ($p < 0.001$), M1and M3 ($p < 0.001$), M2 and M4 ($p < 0.001$) and M3 andM4 ($p < 0.001$).

Table 1 – Mean and standard deviation of systolic blood pressure for different moments

Group	N. of patients	Mean	Standard deviation	P value
Systolic M1	214	118.7	14.25	$p < 0.001$
Systolic M2	214	113.1	14.42	$p < 0.001$
Systolic M3	214	116.6	16.21	$p < 0.001$
Systolic M4	214	119.4	15.13	$p > 0.05$

Concerning to the diastolic measurement, the highest mean was seen at M4, followed by M1, M3 and M2. Comparing these moments, at two comparisons there were no statistically significant differences: M1xM4 ($p > 0.05$) and M2xM3 ($p > 0.05$). At the other comparisons, there were statistically significant differences between M1xM2 ($p < 0.001$), M1xM3 ($p < 0.001$), M2xM4 ($p < 0.001$) and M3xM4 ($p < 0.001$) (table II).

Table 2 – Mean and standard deviation of diastolic blood pressure for different moments

Group	N. of patients	Mean	Standard deviation	P value
Diastolic M1	214	76.8	14.532	$p < 0.001$
Diastolic M2	214	72.1	12.099	$p < 0.001$
Diastolic M3	214	74.1	12.189	$p < 0.001$
Diastolic M4	214	77.9	11.848	$p > 0.05$

DISCUSSION:

Systemic alterations can influence on the dental treatment. Heart diseases play an important role, mainly hypertension, which is the most common diseases in adults. In this study, it was found that there was a significant alteration of blood pressure, because the peak of systolic pressure occurred at the pre-operative time and before the anesthetic solution injection, characterizing the "white coat hypertension".[11]

Salles et al., by studying the influence of vasoconstrictor drugs on blood pressure, affirmed that there were not significant alterations after the application of 2% lidocaine with noradrenaline, 3% prilocaine with felypressin and 2% mepivacaine with epinephrine.[12]

According to Dantas et al., who evaluated the effect of mepivacaine with epinephrine on blood pressure, only the diastolic pressure slightly increased about 1.5 mmHg, which is within the patterns of normal measurements.[13]

In our study, there were alterations in blood pressure between different moments of tooth extraction. The highest mean of systolic pressure measurements was during the pre-operative period. The highest mean of diastolic pressure measurements was after the ending of the procedure.

CONCLUSION:

There was a variation in BP of patients undergoing dental extractions at different moments. This increase is related to fear and anxiety during dental care.

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