



The effect of immediate pre-extraction period On blood pressure level (Prospective study on 100 Iraqi patients)

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Abstract

Although dental extraction has been studied extensively for its effect on the level of blood pressure, taking in consideration the use of epinephrine in dental anesthesia together with the stress factor, there are no available data about the effect of the immediate pre extraction period on the blood pressure level, so the aim of our study is to examine the effect of this period on 100 Iraqi patients within the age group (40-70). The result of this study reveals that No significant difference in the systolic blood pressure levels in this period, No significant difference in the diastolic blood pressure levels in this period, No significant difference between males and females in the same respect, and 21%, 16% of the patients showed decrease in their systolic and diastolic blood pressure levels. The role played by the dentist in stress control can provide a possible explanation for such results.

Key words: immediate pre extraction period, systolic blood pressure, diastolic blood pressure.

Introduction

Dental treatments and dental surgery in particular, including tooth extraction have been extensively studied for its effect on the level of the blood pressure (B.P.) especially for cardiovascular patients⁽¹⁻³⁾, some of these researches studied the effect of using of epinephrine in dental anesthesia⁽⁴⁻⁸⁾, and the effect of stress on the patients undergoing dental treatment⁽⁹⁻¹⁰⁾, Tsuchihashi *etal* 1994 found that the blood pressure during dental surgery cannot be predicted on the bases of baseline B.P. or the response to mental stress, but is related to the cause of tooth extraction and the volume of local anesthetic required to control pain⁽¹¹⁾. Paramaesvaran M,

Kingon AM 1996 found that it's the most stressful part of dental procedure⁽¹²⁾. Hasse AL, Heng MK, Gerrett NR, found that administration of local anesthesia is stressful as tooth extraction for cardiac patients⁽⁵⁾. Nakamura *etal* 2001 found that the level of systolic (B.P.) significantly increased during dental surgery when using Lidocain with epinephrine 1:80000 as local anesthesia⁽⁶⁾, while Brand HS, Abraham-Inpijn L, 1998 found that the cardiovascular changes induced by dental treatment are limited and within normal physiological variation⁽¹³⁾. In spite of extensiveness of researches immediate pre extraction

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period has not been covered for its own effect on the patients B.P. level.

Aim of the study

To evaluate the effect of pre extraction period on the level of systolic and diastolic blood pressure (combined effect of stress and vasoconstrictor containing local anesthesia).

Material and methods

Hundred patients were selected from the patients who came to dental clinic seeking dental extraction; 67% were males and 33% were females, with male to female ratio about 2-1, these patients are within the age group 40 years and more. All these patients have no history of systemic disease.

Patients should have no history of medical disease, and after full medical history taking, we take the 1st measure of the patient blood pressure with a Hg sphygmomanometer, then we give the local anesthesia carpule (*lignospan special*), with the dose 2,2 ml, contains Lidocain hydrochloride 2% and adrenaline 1:80,000 (the manufacturer is SEPTODONT-France). Then we continue the routine dental history taking and routine dental examination. After ensuring that the anesthesia is achieved and the patient is ready for extraction, the same operator re examine the patient blood pressure before starting the extraction procedure, and both blood pressure measures are recorded. The period elapsed between both measures was 5 min $\pm 2/-2$. Suitable statistical analysis can be carried out by using SPSS system.

Results

In our sample we found that there is no significant difference between 1st

and 2nd systolic pressure measurements, and no significant difference between 1st and 2nd diastolic pressures measurements (table 1). Also we found that there is no significant difference between females and males concerning the change in the systolic and diastolic pressure in the two measurements (table 2, table 3).

No change in the blood pressure level in the second reading of the systolic B.P. was 58 patients (58 %), and 61 patients show no change in the 2nd reading of the diastolic B.P.. 21 patients show decrease in systolic pressure, and 21 patients show increase in systolic pressure, and 23% show increase in diastolic pressure, while 16 patients showed decrease in the 2nd diastolic BP. reading. Of the patients showed increase in their blood pressure measurements in the 2nd reading, 11 patients recorded with increase in both systolic and diastolic B.P.

The minimum reading in systolic B.P. recorded in our sample was 100 mm Hg, and the maximum was 140 mm Hg, while the minimum reading recorded in diastolic pressure was 60 mm Hg, and the maximum was 90 mm Hg.

The highest percentage represented by patients with no change in the blood pressure level in the second reading of the systolic B.P. 58 patients (58 %), and 61% of the patients with no change in the 2nd reading of the diastolic B.P. The lowest percentage represented by patients with decrease in the B.P. level in the second measurement in the 2nd diastolic pressure readings (16) patients.

Our study showed that NO significant difference in the blood pressure levels in the immediate pre extraction period also we found that NO significant difference between males and females in the same aspect.

Discussion and conclusion

The reasons for selection of this age group are:

- 1-Middle aged and older patients (>or=40 years old) have a greater increase in blood pressure during dental surgery than younger patients.⁽⁴⁾
- 2-This age group represents the bulk of patients seeking dental extraction compared with other young age groups seeking Alkaramah dental centre for dental treatment.
- 3-As a routine measure, we usually do blood pressure examination for such patient group to exclude the possibility of extracting teeth for patients with uncontrolled or undiagnosed hypertension.

In usual clinical practice it's almost impossible to separate the effect of local anesthesia from the effect of stress on the dental chair. However it's generally accepted that dental treatment has its effect through the elevation of blood pressure level on patients with hypertensive although there is controversy about the effect of that on the clinical management for such patients⁽⁶⁾.

There are no available data in the literature concerning the blood pressure change in the immediate pre extraction period and its role in the patient attitude as he is prepared for dental extraction. From the statistical point of view we found in our sample that there is no significant change in both systolic pressure and diastolic pressures in this period.

Although the effect of stress on the blood pressure level has been mentioned in the literatures^{(9) (10) (14)}, the decrease in the level of B.P level in our study was unexpected, this could be explained by:

- 1-the patients felt relieved after giving anesthesia which removed the sensation of pain
- 2-Comfort of the patient from the working dentists approach during history taking, and this also correct for the patients showed no change in the B.P. level in the second measurement which agrees with Paramaesvaran M, Kingon AM⁽²⁾
- 3-Previous experience in dental extractions in this age group, this agrees with Brand HS, Abraham-Inpijn L⁽³⁾

The fact that there are percentages of patients showed decrease in their systolic and diastolic blood pressure levels (21%, 16%) respectively indicates the possible role played by the dentist in stress control during this period, and its subsequent effect on the B.P. pressure.

References

- 1- Yoshimura Y, Oka M, Kishimoto H, Matsuura R, Mishima K, hemodynamic changes during dental extraction and post-extraction bleeding in patients with prosthetic heart valves. *Int J Oral Maxillofac Surg.* 1987 Aug; 16(4):425-31
- 2- Niwa H, Sugimura M, Satoh Y, Tanimoto A. Cardiovascular response to epinephrine-containing local anesthesia in patients with cardiovascular disease. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2001 Dec; 92 (6):610-6
- 3- Montebugnoli L, Prati C, circulatory dynamics during dental extractions in normal, cardiac and transplant patients, *J Am Dent Assoc.* 2002 Apr;133(4):468-72
- 4- Bader JD, Bonito AJ, Shugars DA, a systematic review of cardiovascular effects of epinephrine on hypertensive dental patients. *Oral Surgery, Oral medicine, Oral pathology, Oral Radiology & Endodontics*, Vol 93, Issue 6, June 2002 Page 647-653
- 5- Hasse AL, Heng MK, Gerrett NR. Blood pressure and electrocardiographic response to dental treatment with the use of local anesthesia. *J Am Dent Assoc.* 1986 Dec;113(6) :868
- 6- Nakamura Y, Matsumura K, Miura K, Kurokawa H, Abe I, Takata Y,

cardiovascular and sympathetic responses to dental surgery with local anesthesia, *Hypertens. Res.* 2001 May; 24(3):209-14.

7- Cintron G, Medina R, Reyes AA, Lyman G. cardiovascular effects and safety of dental anesthesia and dental interventions in patients with recent uncomplicated myocardial infarction. *Arch Intern Med.* 1986 Nov; 146(11):2203-4

8- Meyer FU, hemodynamic changes of local dental anesthesia in Normotensive and hypertensive subjects, *Int J Clin Pharmacol Ther Toxicol*, 1986 Sep;24(9):477-81

9- Beck, FM, Weaver JM 2ND, blood pressure and heart rate responses to anticipated high stress dental treatment *J Dent Res.*, 1981 Jan;60(1):26-9

10- TsuchihasiT, Takata Y, Kurokawa H, Miura K, Maruoa Y, Kajiyama M, Fujishima M., blood pressure response during dental surgery. *Hypertens Res.* 1996 sep; 19(3):189-94

11- Paramaesvaran M, Kingon AM. Alterations in blood pressure and pulse rate in exodontias patients. *Aust Dent J.* 1994 Oct; 39(5):282-6

12- Brand HS, Abraham-Inpijn, cardiovascular responses induced by dental treatment, *Eur J Oral Sci.* 1996 Jun; 104(3):245-52.

13- Matsumura K, Miura K, Takata Y, Kurokawa H, Kajiyama M, Abe I, Fujishima M, changes in blood pressure and heart rate variability during dental surgery *Am J Hypertens*, 1998 Nov; 11(11 Pt 1): 1376-80

14- Brand HS, cardiovascular responses in patients and dentists during dental treatment, *Int Dent J.* 1999 Feb;49(1):60-6

Table 1 (T-test) shows the level of significance between 1st and 2nd readings for both systolic and diastolic B.P. (P<0.05 significant, P>0.05 non significant)

		Mean	Std. Deviation	Std. Error Mean	p-value
Pair 1	sys1st Vs sys2nd	-.10000	9.71773	.97177	.918
Pair 2	dis1st Vs dis2dn	-.10000	7.28150	.72815	.891

Table 2 shows the level of significance between males and females in the systolic pressure for both measurements (P<0.05 significant, P>0.05 non significant)

		t-test for Equality of Means						
		t	df	p-value	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
sys1st	Equal variances assumed	.482	98	.631	1.61465	3.35239	-5.03805	8.26736
	Equal variances not assumed	.525	79.947	.601	1.61465	3.07650	-4.50784	7.73715
sys2nd	Equal variances assumed	.591	98	.556	2.21619	3.74822	-5.22203	9.65441
	Equal variances not assumed	.677	89.586	.500	2.21619	3.27444	-4.28946	8.72184

Table 3 shows the level of significance between males and females in the diastolic pressure for both measurements

		t-test for Equality of Means						
		t	df	p-value	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper	
dis1st	Equal variances assumed	1.436	98	.154	2.79512	1.94669	-1.06803	6.65826
	Equal variances not assumed	1.375	57.130	.174	2.79512	2.03244	-1.27457	6.86480
dis2dn	Equal variances assumed	1.111	98	.269	2.03980	1.83537	-1.60244	5.68204
	Equal variances not assumed	1.142	68.588	.257	2.03980	1.78560	-1.52276	5.60236

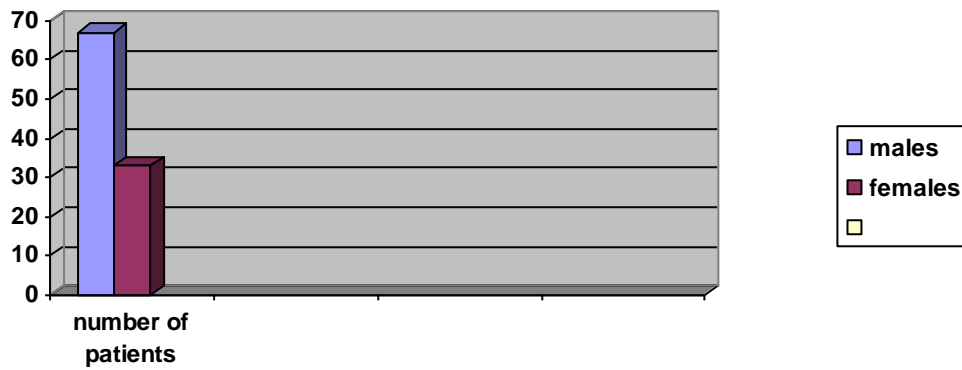


Fig 1 shows the number of patients according to gender

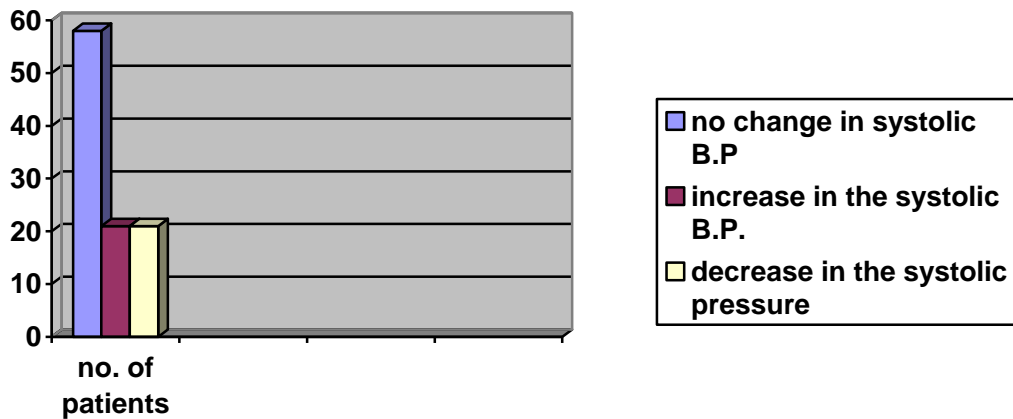


Fig 2 shows no. of patients according to the change in the systolic B.P. in the second reading

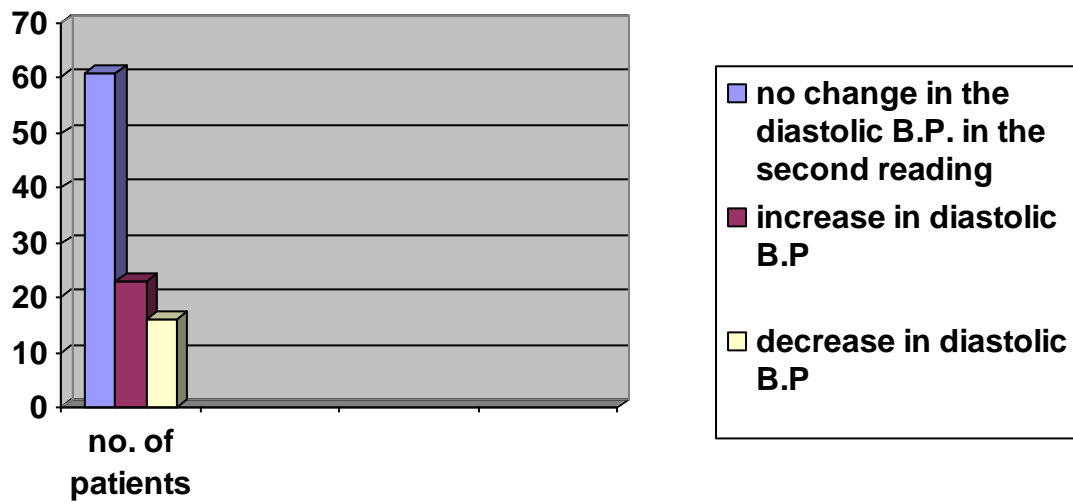


Fig 3 shows no. of patients according to the change in the diastolic B.P. in the second reading