

## Original Article

### Evaluation of changes in Blood pressure and Pulse rate of hypertensive patient during early morning and evening dental appointments

Priyanka<sup>1</sup>, Samir Kumar<sup>2</sup>, Manoj Kumar Thakur<sup>3</sup>

<sup>1,3</sup>Senior Resident NMCH, dept of dentistry, <sup>2</sup>Assistant Professor, Dept of General Medicine, IGIMS,

#### ABSTRACT:

**Background:** Hypertension is a chronic illness which affects more than a billion people worldwide. It is issue of concern therefore it must be considered when treating dental patients. The purpose of our study was to evaluate changes in Blood pressure and Pulse rate of hypertensive patient during early morning and evening dental appointments. **Materials and methods:** This study was conducted among 45 patients of age 40-50 years, requiring a variety of dental procedures. Participants comprised of normal, pre-hypertensive and hypertensive patients visiting the dental clinic. Participants who were taking  $\beta$ -blockers or diagnosed with any cardiovascular disorder except for hypertension were excluded from the study. Blood pressure and pulse rate were recorded as risk indicators which were measured during early morning and evening dental treatment. Blood pressure was measured with a conventional calibrated sphygmomanometer and pulse rate was determined by manual palpation of the radial artery. Statistical analysis was done by using SPSS, version 15 (SPSS, Inc., Chicago, IL) and  $p < 0.05$  was considered statistically significant. **Results:** This study was conducted among 46 patients of age 40-50 years, requiring a variety of dental procedures. Out of these 46 patients, 27 were male and 18 were females. In our study, 15 patients with pre-hypertension i.e. blood pressure of 130/90, 15 patients each with stage 1 and stage 2 hypertension with blood pressures ranging from 140-160/90-100 and 160-180/100-110 respectively. The result of this study shows that mean systolic and diastolic blood pressure (SBP) was more in all the groups during morning appointments. Mean pulse rate (PR) was also more during early morning appointments. **Conclusion:** A dental practitioner must have knowledge of the disease and possess the ability to educate and provide access to care for patients. Our study concluded that mean systolic and diastolic blood pressure (SBP) was more in all the groups during morning appointments. Mean pulse rate (PR) was also more during early morning appointments.

**Key words:** Hypertension, sphygmomanometer, pulse rate, radial artery.

Received: 05 December 2018

Revised: 20 January 2019

Accepted: 22 January 2019

**Corresponding author:** Dr. Deepayan Das, Assistant Professor, Department of Physiology, Gouri Devi Institute of Medical Sciences & Hospital, Rajbandh, Durgapur, Dist. - Burdwan ( W.B.), India

**This article may be cited as:** Priyanka, Kumar S, Thakur MK. Evaluation of changes in Blood pressure and Pulse rate of hypertensive patient during early morning and evening dental appointments. J Adv Med Dent Scie Res 2019;7(2):128-130.

#### INTRODUCTION:

Hypertension is known as the “silent killer” and affects 80 million adults older than 20 years in the US alone.<sup>1</sup> Hypertension is defined as values  $>140$ mmHg SBP and/or  $>90$ mmHg DBP.<sup>2</sup> Hypertension is divided into two main categories: essential/primary hypertension and secondary hypertension.<sup>3,4</sup> Heart Rate is measured by pulse palpation. Heart rate (HR) reflects the number of contractions of the ventricles per unit time and fluctuates substantially with variations in systemic demand for oxygen. Resting heart rate (RHR) monitoring is a simple and noninvasive clinical method related to health prognoses.<sup>5</sup> Dental treatment protocols for hypertensive patients are not much affected if their hypertension is controlled but modifications are advised when patients

present with uncontrolled hypertension.<sup>3</sup> The purpose of our study was to evaluate changes in Blood pressure and Pulse rate of hypertensive patient during early morning and evening dental appointments.

#### MATERIAL AND METHODS:

This study was conducted among 45 patients of age 40-50 years, requiring a variety of dental procedures. The ethical approval for this study was taken from the ethical committee. Informed consent was obtained from all the participants. Participants comprised of normal, pre-hypertensive and hypertensive patients visiting the dental clinic. Participants who were taking  $\beta$ -blockers or diagnosed with any cardiovascular disorder except for hypertension were excluded from the study. Blood

pressure and pulse rate were recorded as risk indicators which were measured during early morning and evening dental treatment. Blood pressure was measured with a conventional calibrated sphygmamometer and pulse rate was determined by manual palpation of the radial artery. Statistical analysis was done by using SPSS, version 15 (SPSS, Inc., Chicago, IL) and  $p < 0.05$  was considered statistically significant.

**RESULTS:**

This study was conducted among 46 patients of age 40-50 years, requiring a variety of dental procedures. Out of these 46 patients, 27 were male and 18 were females. 15 patients were with pre-hypertension i.e. blood pressure of 130/90, 15 patients each with stage 1 and stage 2 Hypertension with blood pressures ranging from 140-160/90-100 and 160-180/100-110 respectively included in the study. Table 2 shows mean blood pressure during early morning and evening dental treatment. The result of this study shows that mean systolic and diastolic blood pressure (SBP) was more in all the groups during morning appointments. Mean pulse rate (PR) was also more during early morning appointments.

**Table 1: Distribution of gender**

Gender	N(%)	p-value
Male	27(60%)	<0.05
Female	18(40%)	
Total	45(100%)	

**Table 2: Mean blood pressure during early morning and evening dental treatment**

Stages	Early morning appointment	Evening appointment
<b>Pre-hypertensive patients(n=15)</b>		
Systolic BP	<b>132±1.20</b>	<b>126±6.28</b>
Diastolic BP	<b>86±2.28</b>	<b>82±8.24</b>
Pulse rate	<b>84.12±9.28</b>	<b>80±10.12</b>
<b>Hypertension Stage I(n=15)</b>		
Systolic BP	<b>142±2.22</b>	<b>140±1.18</b>
Diastolic BP	<b>86.12±3.72</b>	<b>82±5.12</b>
Pulse rate	<b>94±10.15</b>	<b>92±10</b>
<b>Hypertension Stage II(n=15)</b>		
Systolic BP	<b>166.22±7.18</b>	<b>160±5.14</b>
Diastolic BP	<b>102.6±9.52</b>	<b>100±5.76</b>
Pulse rate	<b>90.4±9.24</b>	<b>84±10.68</b>

**DISCUSSION:**

Patients with hypertension are considered high risk group when administering dental local anaesthesia containing a vasoconstrictor because of the potential to undergo epinephrine induced sudden dramatic increase in blood pressure leading to life-threatening hypertensive crisis.<sup>7</sup> According to international guidelines the use of local anaesthesia containing epinephrine is safe in patients with controlled or stage 1 hypertension.<sup>8</sup> Our study was conducted among 46 patients of age 40-50 years, requiring a variety of dental procedures. Out of these 46

patients, 27 were male and 18 were females. In our study, 15 patients with pre-hypertension i.e. blood pressure of 130/90, 15 patients each with stage 1 and stage 2 Hypertension with blood pressures ranging from 140-160/90-100 and 160-180/100-110 respectively. Table 2 shows mean blood pressure during early morning and evening dental treatment. The result of this study shows that mean systolic and diastolic blood pressure (SBP) was more in all the groups during morning appointments. Mean pulse rate (PR) was also more during early morning appointments.

Gungormus M et al determined that there were no significant changes in the blood pressures and the pulse rate of hypertensive patients during surgical procedure, and one cartridge local anesthetic with articain HCl containing 0.012 mg epinephrine may be used safely in hypertensive patients with blood pressure equal or smaller than 154/100 mm Hg.<sup>7</sup>

Chaudhry S et al conducted a study and results of their study shows that a decrease in systolic in stage 2 hypertension patients after 2 and 5 minutes of injections containing 2% Lignocaine with 1:100,000 epinephrine was noted. The diastolic BP (DBP) fell in all the groups after injections. Mean pulse rate increased from three to four beats per minute in all groups except in stage 2 hypertension patients where it slightly decreased.<sup>9</sup>

**CONCLUSION:**

A dental practitioner must have knowledge of the disease and possess the ability to educate and provide access to care for patients. Our study concluded that mean systolic and diastolic blood pressure (SBP) was more in all the groups during morning appointments. Mean pulse rate (PR) was also more during early morning appointments.

**REFERENCES:**

1. Mozaffarian D, Benjamin EJ, Go AS, et al. American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics – 2015 update: a report from the American Heart Association. *Circulation*. 2015;131(4):e29–e322.
2. G.Mancia, R. Fagard, K.Narkiewicz et al., “ESH/ESC guidelines for the management of arterial hypertension: the task force for the management of arterial hypertension of the European society of hypertension (ESH) and of the European society of cardiology (ESC),” *Journal of Hypertension*, vol. 25, no. 9, pp.1751–1762, 2007.
3. Akpunonu BE, Mulrow PJ, Hoffman EA. Secondary hypertension: evaluation and treatment. *Dis Mon*. 1996;42(10):609–722.
4. Whalen K, Finkle R, Panavelil TA. *Lippincott Illustrated Reviews: Pharmacology*. 6th ed. Philadelphia: Wolters Kluwer; 2015.
5. Fernandes R. A., Vaz Ronque E. R., Venturini D., et al. Resting heart rate: Its correlations and potential for screening metabolic dysfunctions in adolescents. *BMC Pediatrics*. 2013;13(1, article no. 48) doi: 10.1186/1471-2431-13-48.
6. Aubertin MA. The hypertensive patient in dental practice: updated recommendations for classification, prevention, monitoring, and dental management. *Gen Dent* 2004; 52: 544-52.

7. Gungormus M, Buyukkurt MC. The Evaluation of the changes in blood pressure and pulse rate of hypertensive patients during tooth extraction. *Acta Med Australasia* 2003; 30: 127-9.
8. Aubertin MA. The hypertensive patient in dental practice: updated recommendations for classification, prevention, monitoring, and dental management. *Gen Dent* 2004; 52: 544-52.
9. Chaudhry S, Iqbal HA, Izhar F, Mirza KM, Khan NF, Yasmeen R, Khan AA. Effect on blood pressure and pulse rate after administration of an epinephrine containing dental local anaesthetic in hypertensive patients. *JPMA-Journal of the Pakistan Medical Association*. 2011 Nov 1;61(11):1088.