

## Original Research

### Assessment of hemodynamic changes during extraction in controlled hypertensive patients

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#### ABSTRACT

**Background:** The present study was conducted to assess hemodynamic changes during extraction in controlled hypertensive patients.

**Materials & Methods:** The present study was conducted on patients of undergoing extractions of both genders. Patients were divided into 2 groups of 32 each. Group I received articaine with 4% epinephrine and group II received 3% mepivacaine without vasoconstrictor. In all patients, blood pressure (diastolic and systolic) and heart rate was compared. **Results:** SBP (mm Hg) in group I before extraction was 126.4 and 130.2 in group II. DBP (mm Hg) was 92.6 in group I and 90.4 in group II. Heart rate was 82.4 in group I and 80.6 in group II. The difference was non- significant ( $P > 0.05$ ). SBP (mm Hg) in group I after extraction was 130.4 and 134.2 in group II. DBP (mm Hg) was 94.2 in group I and 92.8 in group II. Heart rate was 84.6 in group I and 82.2 in group II. The difference was non- significant ( $P > 0.05$ ). **Conclusion:** No significant hemodynamic changes were seen to anesthetic use with a vasoconstrictor and without vasoconstrictor.

**Key words:** Blood pressure, Extraction, hemodynamic changes.

Received: 14 April, 2019

Revised: 12 May 2019

Accepted: 15 May 2019

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**This article may be cited as:** Dar MM, dar JI, Ahad H, Sadaf, Iqra S. Assessment of hemodynamic changes during extraction in controlled hypertensive patients. *J Adv Med Dent Scie Res* 2019;7(7): 19-21.

#### INTRODUCTION

The local anesthetics most often used in dental practice include lidocaine, articaine and mepivacaine. These drugs are normally used in combination with a vasoconstrictor, with the purpose of slowing systemic absorption of the anesthetic – thus prolonging its action and the intensity of block.<sup>1</sup> The use of a vasoconstrictor also increases safety, because lower anesthetic doses are needed, thereby contributing to lessen toxicity. In addition, a certain degree of ischemia is maintained, which facilitates hemostatic action and lessens bleeding.<sup>2</sup>

Hypertension is known as the “silent killer” and affects 80 million adults older than 20 years in the US alone and just 1 billion people worldwide. By 2025, the number of patients diagnosed with hypertension is expected to be 1.56 billion. Hypertension is responsible for 7 million deaths annually

and is one of the leading risk factors for cardiovascular disease mortality.<sup>3</sup> The disease is defined as systolic blood pressure (SBP) of 140 mmHg or diastolic blood pressure (DBP) of 90 mmHg, or any persons being currently prescribed antihypertensive medicine for the purpose of managing hypertension. In addition, hypertension is defined as blood pressure readings elevated on at least two occasions with or without provocation.<sup>4</sup> The present study was conducted to assess hemodynamic changes during extraction in controlled hypertensive patients.

#### MATERIALS & METHODS

The present study was conducted in the department of Oral & Maxillofacial surgery. It comprised of 64 patients of undergoing extractions of both genders. All were informed

regarding the study. Ethical approval was obtained from institute prior to the study. General information such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 32 each. Group I received articaine with 4% epinephrine and group

II received 3% mepivacaine without vasoconstrictor. In all patients, blood pressure (diastolic and systolic) and heart rate was compared. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

Total- 64		
Groups	Group I (4% epinephrine)	Group II (3% mepivacaine)
Number	32	32

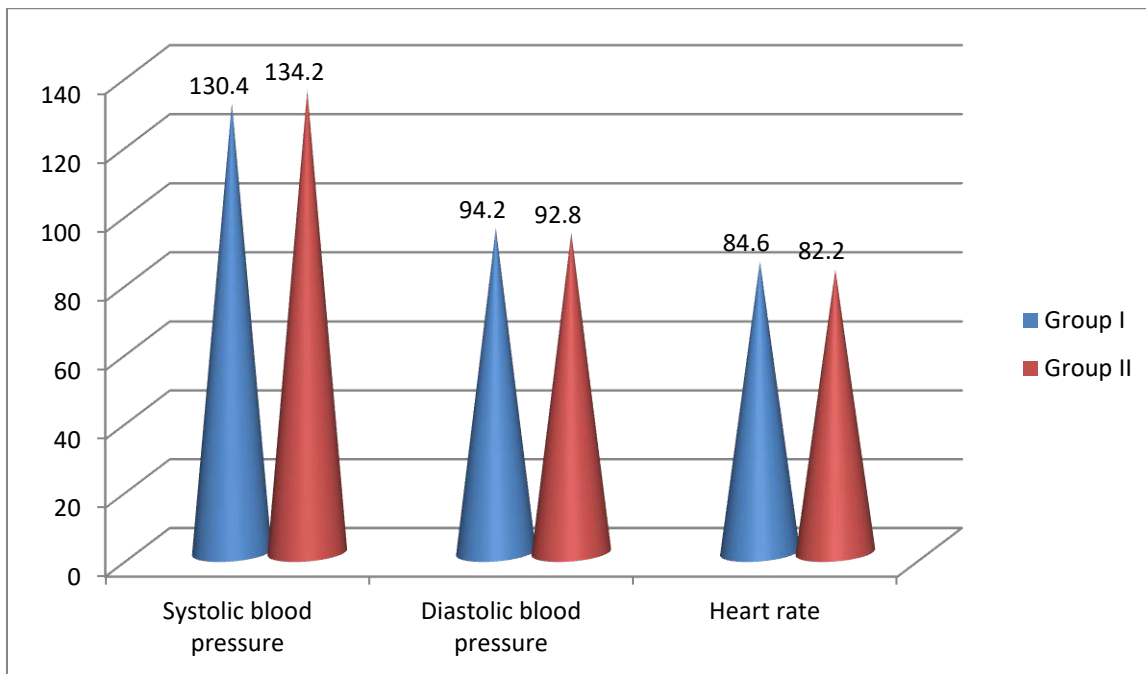
Table I shows that group I patients received articaine with 4% epinephrine and group II received 3% mepivacaine without vasoconstrictor. Each group had 32 patients each.

**Table II Comparison of hemodynamics in both groups before extraction**

Hemodynamics	Group I	Group II	P value
Systolic blood pressure	126.4	130.2	0.51
Diastolic blood pressure	92.6	90.4	0.42
Heart rate	82.4	80.6	0.12

Table II shows that SBP (mm Hg) in group I was 126.4 and 130.2 in group II. DBP (mm Hg) was 92.6 in group I and 90.4 in group II. Heart rate was 82.4 in group I and 80.6 in group II. The difference was non- significant (P> 0.05).

**Graph I: Comparison of hemodynamics in both groups after extraction**



Graph I shows that SBP (mm Hg) in group I was 130.4 and 134.2 in group II. DBP (mm Hg) was 94.2 in group I and 92.8 in group II. Heart rate was 84.6 in group I and 82.2 in group II. The difference was non- significant (P> 0.05).

## DISCUSSION

Many hemodynamic studies have been made in patients subjected to local anesthetic injection with a vasoconstrictor. Some have been in subjects without a history of disease – no significant changes having been recorded in either blood pressure (systolic and diastolic) or heart rate. However, some authors have suggested that such changes are dependent upon the injected vasoconstrictor dose. It is clear that important variations are to be expected if the injection technique is not performed carefully and the solution is accidentally injected into a blood vessel.<sup>5</sup>The present study was conducted to assess hemodynamic changes during extraction in controlled hypertensive patients.

In this study, group I patients received articaine with 4% epinephrine and group II received 3% mepivacaine without vasoconstrictor. Each group had 32 patients each. A et al<sup>6</sup> conducted a prospective observational study in hypertensive patients (n=97) with a mean age of 60.45±9.60 years. The following parameters were monitored at three different timepoints (before the procedure, 3 minutes after local anesthesia infiltration, and 3 minutes after the operation): blood pressure (diastolic and systolic), heart rate, and oxygen saturation. Anesthesia (1-3 carpules) was provided in the form of articaine with 4% epinephrine as vasoconstrictor in one group, while another group received 3% mepivacaine without vasoconstrictor. All patients presented primary hypertension (n= 97)(grade I in 57.7% of the cases and grade II in 42.3%). The most widely used antihypertensive drugs were angiotensin II receptor antagonists (ARA II). The only significant differences observed corresponded to systolic blood pressure measured before and after dental extraction in the group of hypertensive patients anesthetized with vasoconstrictor.

We found that SBP (mm Hg) in group I was 126.4 and 130.2 in group II. DBP (mm Hg) was 92.6 in group I and 90.4 in group II. Heart rate was 82.4 in group I and 80.6 in group II. The difference was non- significant (P> 0.05).

Silvestre et al<sup>7</sup> the fact of using or not using a vasoconstrictor with the local anesthetic solution exerts no effect upon blood pressure in normotensive patients – though a certain increase in systolic blood pressure (SBP) was noted at the moment of tooth extraction and at the end of the procedure. This was attributed to increased patient anxiety during extraction, taking into account that the difference was comparatively greater between SBP at the start of the procedure and at the actual moment of extraction.

We found that SBP (mm Hg) in group I was 130.4 and 134.2 in group II. DBP (mm Hg) was 94.2 in group I and 92.8 in group II. Heart rate was 84.6 in group I and 82.2 in group II. Laragnoit et al<sup>8</sup> reported no increases in heart rate or blood pressure in patients with heart disease during dental treatment with local anesthesia plus a vasoconstrictor. Fellows et al<sup>9</sup> using intravenous injections

of epinephrine (3.5 pg in one minute), recorded a 30% increase in heart rate (HR), though the values returned to baseline levels after 15 minutes.

## CONCLUSION

No significant hemodynamic changes were seen to anesthetic use with a vasoconstrictor and without vasoconstrictor.

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