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Difference in Blood Pressure and Pulse Rate Pre- and Post-extraction of Teeth

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Abstract

Objective: To evaluate and compare blood pressure and pulse rate Pre- and Post-extraction of teeth.

Materials & Methods: The Systolic & Diastolic blood pressure of 40 Indian patients in the age group of 20–50 years old were recorded using a Dial-type BP apparatus & Stethoscope before and after dental extraction. The Pulse rate was also recorded pre- and post-extraction by palpating the radial pulse and recording it with a stopwatch for 1 minute.

Results: 75 per cent of the patients had no significant change in blood pressure pre- and post-extraction, while 17.5 percent of the patients had an increase in blood pressure post-extraction. 7.5 per cent of the patients had a fall in blood pressure following dental extraction. Evaluation of pre- and post-extraction pulse rate shows no significant change in pulse rate in 92.5 per cent of the patients studied and 5 per cent of the patient had an increase in pulse rate post-extraction. 2.5 percent of the 40 patients studied had a decrease in pulse rate post-extraction.

Conclusion: There's no significant difference in blood pressure & pulse rate pre- and post-extraction.

Keywords: Blood Pressure, Pulse Rate, Dental Extraction, Dental Risk, Anxiety in Dentistry

1. Introduction

Many people have become the victim of hypertension. The mundane style of living, coupled with increasing stress at work and unhealthy eating habits have long been the culprit to this pandemic. Subsequently, the trend is to link everything to the risk of hypertension. The possibility of dental extraction contributing as a risk factor for hypertension remains unknown. In the dental profession, it is a question whether dental extraction could cause a significant change in blood pressure which in combination with the stressful environment could cause harm or even death to the patient if not managed properly.

Arterial Blood Pressure may be defined as the lateral pressure exerted by the contained column of blood on the wall of arteries. The pressure is exerted when the blood flows through the arteries. Generally, the term 'blood pressure' refers to arterial blood pressure. Arterial blood pressure is expressed in four different terms: 1. Systolic blood pressure 2. Diastolic blood pressure 3. Pulse pressure 4. Mean Arterial blood pressure (Sembulingam & Sembulingam, 2010).

Hypertension is a sustained elevation of the systemic arterial pressure (Barrett, Barman, Boitano & Brooks, 2010) 2. Hypertension is reported by the World Health Organisation as one of the most important causes of premature morbidity and mortality, although it is often asymptomatic.

Some of the risk factors which could lead to hypertension include alcohol consumption, obesity, renal diseases, endocrine diseases, and coarctation of the aorta (Colledge, Walker, & Ralston, 2010).

2. Methodology

A study was conducted in VMS dental college on 40 Indian patients to evaluate and compare the blood pressure and pulse rate before and after dental extraction.

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Male and female patients in the age group of 20–50 years old who are not under medication and without any history of hospitalization were included in the study. Patients less than 20 years old and more than 50 years old were excluded from the study. Other exclusion criteria includes: pregnant and lactating female, mentally or physiologically affected individuals, patients with drug addiction, patients on medication or hospitalization in the recent past six months, and patients with diabetes mellitus, myocardial infarction, hypertension, or hypotension. The study was carried out using a dial type BP apparatus and stethoscope to record the patient's blood pressure and by palpating the patient's radial pulse aided by a stopwatch to record the pulse rate in one minute. The protocol involves an informed consent form from the patient, case history evaluation, pre-extraction extraoral & intraoral photographs, recording of blood pressure and pulse rate, following which the dental extraction was done. Post extraction blood pressure and pulse rate was recorded along with post-extraction extraoral and intraoral photographs. The blood pressure and pulse rate was taken at least twice to obtain a mean value which was used to calculate the difference in value pre- and post-extraction. Confounding errors for the study was the surgeon during the extraction, number of teeth to be extracted, and difficulty of extraction. Difference in Pre- and Post-extraction blood pressure of 10 mmHg and more above the pre-extraction blood pressure is perceived as an increase in blood pressure and difference in Pre- and Post-extraction blood pressure of 10 mmHg and lesser below the pre-extraction blood pressure is perceived as decrease in blood pressure. Similarly, difference in Pulse rate of 10/min or more above the pre-extraction value is perceived as increase in pulse rate while difference in Pulse rate of 10/min or less below the pre-extraction value is perceived as decrease in pulse rate.

3. Results

Through the examination of 40 Indian patients in VMS dental college, it was determined that 75 per cent of the patients had no significant change in blood pressure pre- and post-extraction, while 17.5 per cent of the patients had an increase in blood pressure post-extraction. 7.5 percent of the patients had a fall in blood pressure following dental extraction. Evaluation of pre- and post-extraction pulse rate shows no significant change in pulse rate in 92.5 per cent of the patients studied and 5 per cent of the patient had an increase in pulse rate post-extraction. 2.5 per cent of the 40 patients studied had a decrease in pulse rate post-extraction.

Table 1. Difference in Blood Pressure Pre- & Post-extraction

Increase in B.P (no. of patients)	Decrease in B.P (no. of patients)	No change in B.P (no. of patients)
7	3	30

Table 2. Difference in Pulse rate Pre- & Post-extraction

Increase in P.R (no. of patients)	Decrease in P.R (no. of patients)	No change in P.R (no. of patients)
2	1	37

Tables show the results obtained from the study done on 40 Indian patients in the age group of 20–50 years old, conducted in VMS dental college by the author.

Table 1: Difference in blood pressure pre- & post-extraction in 40 Indian patients in the age group of 20–50 years old had done in VMS dental college from August 2013 to October 2013.

Table 2: Difference in pulse rate pre- & post- extraction in 40 Indian patients in the age group of 20–50 years old did in VMS dental college from August 2013 to October 2013.

4. Discussion

The study was conducted to evaluate whether dental extraction could cause a change in blood pressure, significant enough to be considered as a risk of hypertension which in combination with the stressful environment of the dental setting may have harmful or even fatal consequences to the patients. Therefore, it is imperative that health care providers be aware of patients' blood pressures.

The increase in blood pressure post-extraction in 17.5 percent of the patients studied may be due to anxiety of the patient, or stress implicated by the dental procedure which may sometimes be compounded by less skilled dental surgeon. There may be a surge of adrenaline by the patient's adrenal gland during dental procedure to cope with the stress and eventually an increase in blood pressure. The cause for the drop in blood pressure in 7.5 percent of the patients was unknown. The rise in Pulse rate post extraction in 5 per cent of the patients studied could be attributed to anxiety and fear of dentistry. This

may be so because many patients who came to the OP were at least a little anxious, owing to the taboo in dentistry which lingers amongst Indian society of lower income. The drop in pulse rate in 2.5 per cent of the patients studied could be due to a relieved patient after a simple dental extraction before which the patient could have been very anxious or may also be attributed to observational error by the examiner.

A manual BP apparatus was used because it was thought to be more accurate than a digital B.P apparatus. A dial type BP apparatus was used for its lightweight convenience and portability to be used at the dental chair. Patient's radial pulse was palpated on the right hand in all the patients to minimize systemic error. The same stopwatch was used to record the pulse rate of all patients. Due to the lack of time and taking into account the patient's welfare, the extractions were performed by a number of different dental surgeon with different skills and experience, instead of a single skilled & experienced dental surgeon. This adds to the error in the study. The type of extraction cases and the number and position of tooth to be extracted couldn't be selected specifically due to the large variant of cases presented to the OP daily. However, the examination of the patients, recording of blood pressure and pulse rate, along with the evaluation of change in the values were done by the same person who did the study. The difference of 10mmHg in blood pressure which was set as a determining point on whether there's a raise or drop in blood pressure was not certified by a qualified statistician but instead was determined only by the person who did the study. In all the case the difference in mean arterial blood pressure was taken.

5. Conclusion

The study could use a more accurate and professional approach to obtain a more reliable and accurate result.

Based on the results obtained from the study in this case, it is concluded that there is no significant difference in blood pressure and pulse rate pre- and post-extraction of teeth. Therefore, a minor surgical procedure such as a dental extraction would not affect the patient deleteriously.

6. References

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