

A Comparative Study to Assess the Effect of Oral Alprazolam as Premedication on Vital Parameters of Patients During Tooth Extraction - A Retrospective Observational Study

Dr Rakesh Kumar Doodi, ¹ Dr. Amit Kumar Sharma, ² Dr. Yogendra Malviya, ³ Dr. Aparajita Adurti, ⁴ Dr. Basudha Mukherjee, ⁵ Dr. Aabhash Agarwal ⁶

1. Dr. Rakesh Kumar Doodi

PG Student, Department of Oral and Maxillofacial Surgery, Jaipur Dental College, Jaipur, Rajasthan, India

2. Dr. Amit Kumar Sharma

Professor, Department of Oral and Maxillofacial Surgery, Jaipur Dental College, Jaipur, Rajasthan, India

3. Dr. Yogendra Malviya

Assistant Professor, Department of Oral and Maxillofacial Surgery, Jaipur Dental College, Jaipur, Rajasthan, India

4. Dr. Aparajita Adurti

Post Graduate Student, Department of Oral and Maxillofacial Surgery, Jaipur Dental College, Jaipur, Rajasthan, India

5. Dr. Basudha Mukherjee

Post Graduate Student, Department of Oral and Maxillofacial Surgery, Jaipur Dental College, Jaipur, Rajasthan, India

6. Dr. Aabhash Agarwal

Post Graduate Student, Department of Pediatric and Preventive Dentistry, Jaipur Dental College, Jaipur, Rajasthan, India

CORRESPONDING AUTHOR

Dr. Rakesh Kumar Doodi

Jaipur Dental College,

Maharaj Vinayak Global University Dhand, Amer,

Jaipur-Delhi National Highway 11c, Jaipur-302038 (Rajasthan)

Mobile - 7239823180

Email - dr.rdoodi@gmail.com

Abstract

Background: One of the most common dental procedures associated with preoperative anxiety is the removal of a tooth¹.with the fast pace at which surgical procedures of the head and neck are evolving, holistic procedures have come into light in order to provide patients with a comfortable surgical experience.

Patients and Methods: A total of 80 patients were taken for this study wherein 40 patients were given 0.5mg tab. Alprazolam and 40 patients underwent extraction without any premedication.

Results: On the pre-operative day, mean systolic blood pressure in study group was 116.475±7.646 in control group was 119.325±5.171.on the intra -operative day, mean systolic blood pressure in study group was 122.150 ±6.788 in control group was 127.750 ± 3.543. On the post-operative day, mean systolic blood pressure in study group was 120.750± 7.337 in control group was 125.650 ± 3.759. On the pre-operative, mean pulse rate in study group was

¹ Lago-Méndez L, Diniz-Freitas M, Senra-Rivera C, Seoane-Pesqueira G, Gándara-Rey JM, Garcia-Garcia A. Dental anxiety before removal of a third molar and association with general trait anxiety. J Oral Maxillofac Surg. 2006;64:1404–8.

76.500±7.535 in control group was 79.650±5.021, On the intra-operative, mean pulse rate in study group was 82.950±7.031 in control group was 89.550±4.517. On the post-operative, mean pulse rate in study group was 80.350±6.435 in control group was 85.600±4.903. On the pre-operative, mean oxygen saturation (in %) in study group was 96.100±2.550 in control group was 95.825±2.252. On the intra-operative, mean oxygen saturation (in %) in study group was 95.375±2.393 in control group was 94.925±2.005. On the post-operative, mean oxygen saturation (in %) in study group was 94.325±2.474 in control group was 93.950±1.974

Conclusions: Premedication with oral benzodiazepines such as oral alprazolam can be utilized for patients with apprehension towards dental treatment and needle phobia.

Keywords: Dental Extraction, pre-medication, benzodiazepines, local anesthesia

INTRODUCTION

Surgical procedures of the oral cavity and the head and neck are evolving at a very fast pace. Improved techniques coupled with holistic understanding of regional anatomy backed by improvements in local anesthesia (LA) have almost brought us to the brink at which, we can state that oral procedures are relatively safe with least risk of complications. However, there has been a weak cornerstone of these otherwise comfortable procedures. The weak cornerstones we are referring to are fear and anxiety. Although it is debatable that fear and anxiety are relative factors, it is beyond doubt that these reflect as changes in vital parameters of the patient which includes blood pressure, pulse rate, and oxygen saturation and in turn act as early warning signs for a number of medical emergencies. Anxiety during dental treatment can cause stress and discomfort in patients and lead to dental treatment avoidance with consequent damage to the oral health of phobic patients. In this context, effective control of anxiety plays a pivotal role in patient compliance to dental treatment. The use of conscious sedation is an important strategy for the behavioural management of patients who suffer from anxiety over dental treatment. Conscious sedation is an approach that uses one or more drugs to produce a state of central nervous system depression while maintaining verbal contact with the patient throughout the procedure. The sedation level should be such that the patient remains conscious and can readily understand and respond to verbal instructions or tactile stimulation.

Indications for the use of conscious sedation include a diagnosis of anxiety and dental phobia, prolonged or traumatic dental procedures and medical conditions potentially aggravated by stress, which can reduce the patient's ability to cooperate. Additionally, the release of endogenous catecholamines can increase the cardiovascular system load in patients with a history of angina, whereas asthmatic patients can present stress-induced acute episodes of breathing difficulty induced by stress. These are among some of the patients' profiles that can benefit from conscious sedation in reducing exacerbation risk. The risk-benefit should be determined according to the severity of the patient's condition. Benzodiazepines are widely used in oral sedation to induce a state of anxiety in dental procedures. These drugs are among the most commonly prescribed and employed for this purpose worldwide. The hypothesis of this study was that conscious oral sedation is effective and safe for use in dental procedures. The gap in knowledge on the use of drugs for oral sedation in dentistry prompted this systematic review to determine the effectiveness and safety of oral sedation drugs in adult patients undergoing dental surgical procedures².

METHODS

Sample size was 80 patients. Forty patients were given a preoperative single dose of oral tablet alprazolam 0.5mg as premedication (study group), whereas the other Forty were treated without any premedication (control group). Blood pressure, and

² Araújo JO, Bergamaschi CC, Lopes LC, Guimarães CC, de Andrade NK, Ramacciato JC, Motta RHL. Effectiveness and safety of oral sedation in adult patients undergoing dental procedures: a systematic review. *BMJ Open*. 2021 Jan 25;11(1):e043363. doi: 10.1136/bmjopen-2020-043363. PMID: 33495257; PMCID: PMC7839856.

pulse rate were monitored and recorded with the help of digital blood pressure monitor. Oxygen saturation was recorded with help of pulse oximeter. Single dose of oral tablet alprazolam 0.5 mg was given 30 min before the procedure to the study group. Baseline vital parameters (blood pressure, pulse rate, and oxygen saturation) were measured and recorded on the first visit. All patients were advised to report 60 min before the scheduled time of extraction. On the day of the extraction procedure, vital parameters were monitored and recorded pre-operatively, during extraction and post operatively. Females and males between 20-60 years of age. Patients with mandibular posterior tooth extraction, Extraction with inferior alveolar nerve and long buccal nerve block (2-3 prick of injection), Extraction with Nearly 2% Lignocaine hydrochloride with 1:80,000 adrenaline solution (Maximum 5ml solution) were included in the study. Patients who were not willing to participate in this study, Patients allergic to benzodiazepines, Medically compromised patients with conditions such as hypertension, diabetes, bronchial asthma and Patients with a history of alcohol abuse as well as those are undergoing psychiatric were excluded from the study.

PROCEDURE

- Each patient from both the groups were explained about tooth extraction procedure.
- Consent was taking from every patient in both the groups.
- Study group patients were administered oral alprazolam 0.5 mg 30 min before the procedure.

Vital parameters were recorded at each of these steps

1. Pre operatively.
2. During procedure of tooth extraction.
3. Immediate post operatively

RESULTS - Statistical Analysis

Data were entered in Microsoft Excel, and statistical analysis was performed using SPSS version 18.0 (Chicago Inc.). Categorical values were expressed in the form of frequencies and percentages, whereas continuous variables were expressed as Mean \pm SD. Association between different study groups at different time interval was assessed using independent student t test and chi square test. p value was kept at < 0.05 to establish statistical significance.

RESULTS - Systolic Blood Pressure (mmhg)

1. On the pre-operative day, mean systolic blood pressure in study group was 116.475 ± 7.646 in control group was 119.325 ± 5.171 . Thus, there was a statistically significant difference ($p = 0.054$) between the two groups.
2. On the intra-operative day, mean systolic blood pressure in study group was 122.150 ± 6.788 in control group was 127.750 ± 3.543 . Thus, there was a statistically significant difference ($p = 0.000$) between the two groups.
3. On the post-operative day, mean systolic blood pressure in study group was 120.750 ± 7.337 in control group was 125.650 ± 3.759 . Thus, there was a statistically significant difference ($p = 0.000$) between the two groups.

PULSE RATE (beats/min)

1. On the pre-operative, mean pulse rate in study group was 76.500 ± 7.535 in control group was 79.650 ± 5.021 . Thus, there was a statistically significant difference ($p = 0.031$) between the two groups.
2. On the intra-operative, mean pulse rate in study group was 82.950 ± 7.031 in control group was 89.550 ± 4.517 . Thus, there was a statistically significant difference ($p = 0.000$) between the two groups.
3. On the post-operative, mean pulse rate in study group was 80.350 ± 6.435 in control group was 85.600 ± 4.903 . Thus, there was a statistically significant difference ($p = 0.000$) between the two groups.

OXYGEN SATURATION (IN %)

1. On the pre-operative, mean oxygen saturation (in %) in study group was 96.100 ± 2.550 in control group was 95.825 ± 2.252 . There was a statistically non-significant difference ($p = 0.611$) between the two groups.
2. On the intra-operative, mean oxygen saturation (in %) in study group was 95.375 ± 2.393 in control group was 94.925 ± 2.005 . Thus, there was a statistically non-significant difference ($p = 0.365$) between the two groups .
3. On the post-operative, mean oxygen saturation (in %) in study group was 94.325 ± 2.474 in control group was 93.950 ± 1.974 . Thus, there was a statistically non-significant difference ($p = 0.456$) between the two groups (figure-1,2,3)

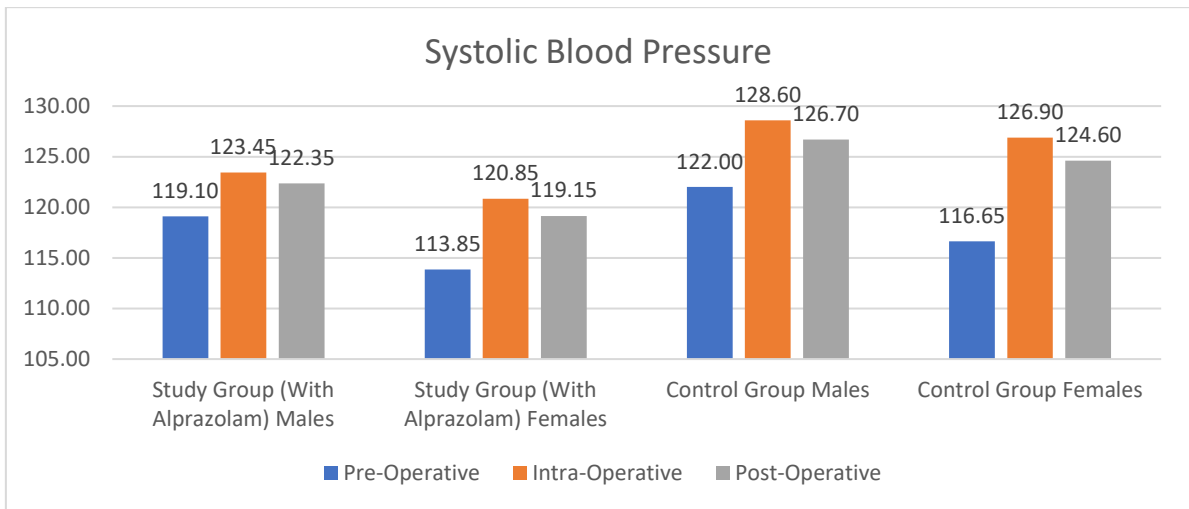


Figure-1

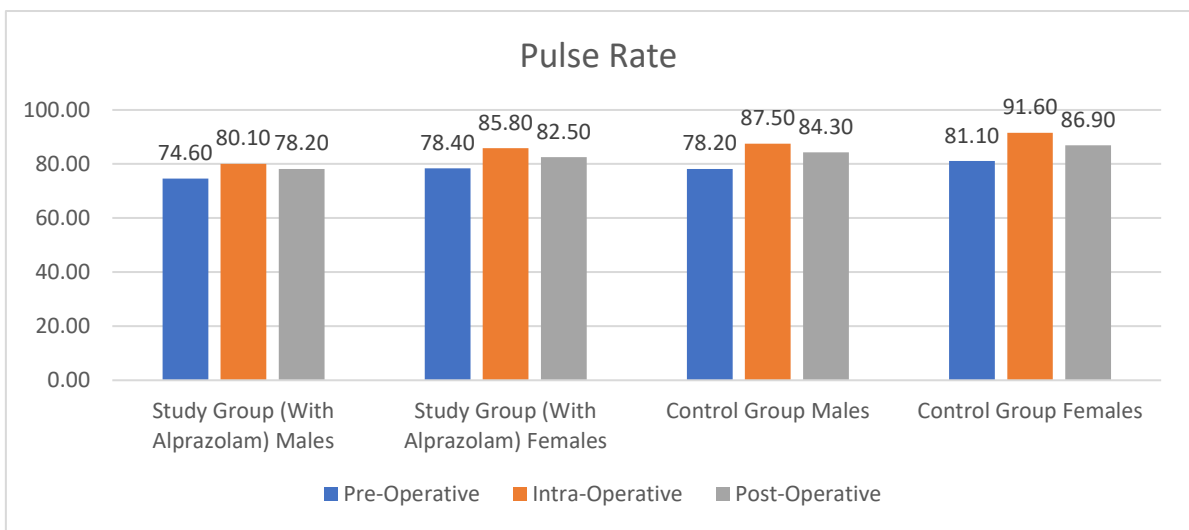


Figure-2

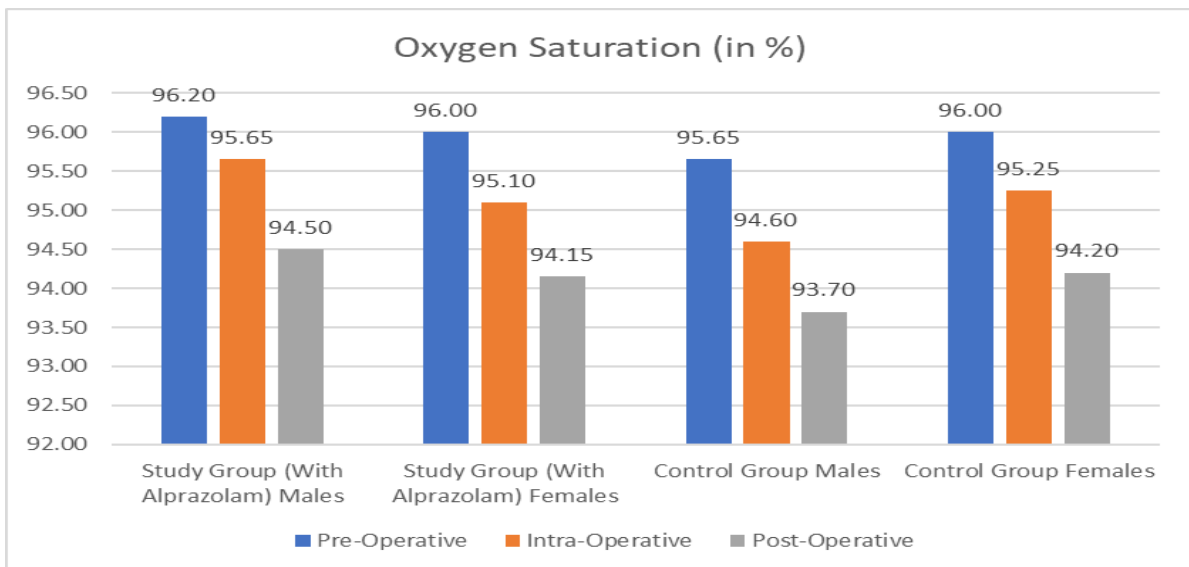


Figure-3

DISCUSSION

The aim of this study was to assess the effect of an anti-anxiety drug on patients undergoing surgical removal of mandibular posterior tooth extraction. The control of fear, anxiety, and pain is an essential part of dental practice. In spite of technological advances in dentistry, fear and anxiety continue to plague the common man. Anxiety is not a unifactorial entity. It is an emotional state, which has a direct pertinence on the physiological and psychological makeup of an individual. Missing the appointments and uncooperative attitude toward the treatment are some of the sequelae of this problem, thus, adding to the misery and making the patient suffer further from the existing pathological conditions. In this comparative study, the effect of an anxiolytic agent - tablet alprazolam 0.5 mg, on vital parameters such as SBP, pulse rate, and oxygen saturation were studied in various phases of a surgical procedure. Meechan and Seymour in 1993 suggested various sequelae that arise after third molar surgery and their use for assessing the efficacy of a variety of therapeutic measure. The surgical procedure provides an opportunity to investigate onset, depth, duration, and possible systemic effects of local anesthetic solutions. Furthermore, the anxiety which often accompanies such surgery lends itself to the appraisal of different anxiolytic agents and sedation techniques. The immediate postoperative sequelae of pain, buccal swelling, and trismus provide a useful clinical model for evaluating the efficacy of analgesics and anti-inflammatory drugs³. Transient loss of consciousness or vasovagal syncope is a well-known phenomenon in dental/maxillofacial surgery⁴. Hypoxia commonly arises in dental

patients during and after surgery. This dangerous condition requires the clinician to monitor patients' vital signs - specifically pulse rate and blood oxygen content - for any signal of trouble. A technique called pulse oximetry offers a noninvasive, immediate, and continuously available means of accomplishing this^{5,6}. In this study, patients who fulfill the inclusion criteria were taken up for the study and randomly divided into control group and study group. We observed that preoperative vital parameters of patients on the day of extraction of tooth were slightly increased as compared to their baseline measurement. In the study group patients, vital parameters exhibited minimal fluctuation all through the surgical steps unlike in the control group where there was fluctuation at LA, incision, bone guttering, and tooth elevation steps. Thus, use of preoperative tablet alprazolam 0.5 mg orally for reduction of patients' anxiety, increases patient cooperation and operator efficiency. Oral premedication with benzodiazepines or other anti-anxiety agents is considered for patients who are needle phobic with documented psychological and physiological complications⁷. Furthermore, constant monitoring of vital parameters helps us to prevent unwanted emergency which includes syncope.

CONCLUSION

In the current study it was concluded that prescription of oral benzodiazepines can be utilized as a premedication to reduce the stress of the patient as well have a profound effect on the quality of the treatment and the stress surrounding a surgical procedure.

Further studies are recommended with large sample size to confirm these findings.

³ Meechan JG, Seymour RA. The use of third molar surgery in clinical pharmacology. *Br J Oral Maxillofac Surg.* 1993;31:360–5.

⁴ Arakeri G, Arali V. A new hypothesis of cause of syncope: Trigemino-cardiac reflex during extraction of teeth. *Med Hypotheses.* 2010;74:248–51.

⁵ Gandy SR. The use of pulse oximetry in dentistry. *J Am Dent Assoc.* 1995;126:1274–6, 1278.

⁶ Jafarzadeh H, Rosenberg PA. Pulse oximetry: Review of a potential aid in endodontic diagnosis. *J Endod.* 2009;35:329–33

⁷ Sokolowski CJ, Giovannitti JA, Jr, Boynes SG. Needle phobia: Etiology, adverse consequences, and patient management. *Dent Clin North Am.* 2010;54:731–44.