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COMPARISON OF THE EFFECT OF CONSCIOUS SEDATION VS LOCAL ANAESTHESIA ON MANAGEMENT OF MAXILLOFACIAL TRAUMA WITH CLOSED REDUCTION

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ABSTRACT

Introduction: Minor oral surgical procedures are routinely carried out under local anaesthesia. However, favourable conditions for the operator and patient are seldom achieved. The technique of anaesthesia in the form of "conscious sedation" has been developed to overcome the drawbacks of operating under local anaesthesia alone and to avoid the risks associated with general anaesthesia. **Objective:** The purpose of this study is to investigate the effects of sedation on postoperative pain and patient satisfaction in patients undergoing closed reduction of maxillofacial trauma under conscious sedation with local anaesthesia versus local anaesthesia alone. Methods: The study included patients aged 18-78 years who presented to the Oral and Maxillofacial Surgery Department for closed reduction of maxillofacial trauma. Patients were divided into two groups based on the anesthetic technique used for the procedure: (i) local anaesthesia (Control group, n=5) and (ii) Conscious sedation + local anaesthesia (Experimental group, n=5). Postoperative pain was assessed using Visual Analogue Scale (VAS). Relationship between VAS scores and age groups was analyzed in both experimental and control groups. Patient satisfaction was assessed via face-to-face or telephone interviews 7 days after the procedure in both groups. **Results:** The VAS scores were significantly lower in the experimental group compared to the control group in all three measurements ($p<0.05$). A significant difference was found between the two groups with regard to their responses in the satisfaction questionnaire ($p<0.0001$), whereby 80% of the patients in the experimental group replied as "Absolutely yes". **Conclusion:** The results indicated that the pain levels were lower in patients that underwent closed reduction of maxillofacial trauma under conscious sedation with local anaesthesia compared to patients that underwent local anaesthesia alone.

KEYWORDS : Conscious sedation, closed reduction, trauma, pain

INTRODUCTION:

There are a lot of dental procedures that need pain management before they can be performed. Most of them can be done easily after pain is controlled with local anaesthesia. However, adequate physician-patient communication may not be achieved with local anaesthesia among patients with dental anxiety. Conscious sedation can be used to solve anxiety-related issues in these situations. According to Ryder and Wright (1988), dental sedation is a method that is used to psychologically and physiologically reduce or eliminate patients' dental anxiety without causing them to lose consciousness, cooperate, or have protective reflexes [1].

Conscious sedation is a method in which a drug or drugs cause a depression of the central nervous system (CNS) that makes it possible to treat the patient while maintaining verbal contact with them throughout the sedation [2]. Conscious sedation drugs and methods should have a margin of safety large enough to make it unlikely that a patient will lose consciousness during dental treatment. The patient is still able to independently and continuously maintain a patent airway under conscious sedation. It is necessary to carry out a careful pre sedation evaluation with regard to the airway, fasting, and comprehension of the drugs' pharmacodynamics and pharmacokinetics. It is necessary to guarantee that the recovery area has well-trained staff, appropriate intraoperative monitoring, venous access, and airway management equipment [4].

Closed reduction of fractures can be characterized as the treatment of broken fragments without penetrating skin or mucous layers [5]. There are numerous approaches to closed reduction; However, the use of materials that, in ideal circumstances, prevent the movement of bony segments during the healing phase is common to all of these methods. The most basic and fundamental elements in administration of any fracture are reduction and adjustment of the fracture, which ought to be achieved by the least difficult means conceivable to accomplish ideal outcomes [6]. In light of these assertions, "closed reduction" is still extensively utilized in the effective management and treatment of all kinds of mandibular and dentoalveolar fractures.

We compared the effects of conscious sedation with local anaesthesia and sedation alone on postoperative pain and patient satisfaction in patients undergoing closed reduction of maxillofacial trauma.

MATERIALS AND METHODOLOGY:

The study included patients aged 18-78 years who presented to the Oral and Maxillofacial Surgery Department at Saveetha Dental College and Hospital, Chennai, Tamil Nadu, India with history of maxillofacial trauma requiring closed reduction with arch bar placement. The study was approved by the institutional ethics committee and an informed consent was obtained from each patient. Patients were divided into two groups based on the anesthetic technique used for the procedure: (i) local anaesthesia (Control group, n=5) and (ii) Conscious sedation + local anaesthesia (Experimental group, n=5).

The maxillary and mandibular anaesthesia was induced with 2% lignocaine hydrochloride + 1:100,000 epinephrine. In the experimental group, preoperative conscious sedation was achieved with Inj. Midazolam 0.025mg/kg IV and Inj. Propofol 0.5mg/kg IV following the induction of local anaesthesia. Postoperative pain was assessed using Visual Analogue Scale (VAS), in which a score of 0 indicates no pain, values between 0-3 indicate mild pain, values between 4-7 indicate moderate pain, values between 8-10 indicate severe pain, and a score of 10 indicates the most severe pain. VAS scores were assessed on days 2 and 7 after surgery. This study was conducted by a single operator. Patient satisfaction was assessed via face-to-face or telephone interviews 7 days after surgery in both groups. In the patient satisfaction questionnaire, the participants in both groups were asked "Would you prefer to undergo the same procedure once again?" and the possible replies included "Absolutely yes", "Maybe", and "No".
In both groups, postoperative medication included Amoxicillin + Clavulanic acid (2 times a day for 5 days), non-steroidal anti-inflammatory drugs (NSAIDs) (2 times a day for 5 days), and 0.12% chlorhexidine gluconate mouthwash (3 times a day for 5 days) beginning from the second day after surgery.

Inclusion criteria

- ASA score of I or II
- Aged 18 years or older
- Maxillofacial trauma that can be managed with closed reduction alon
- Regular follow-up
- Regular use of postoperative medication

- No signs of oral infection
- Eligibility for conscious sedation
- Voluntary participation and providing a written informed consent.

Exclusion criteria

- Systemic diseases
- Irregular follow-up and not responding to telephone calls
- Maxillofacial trauma requiring open reduction
- Irregular use of postoperative medication
- Refusing to participate or provide a written informed consent or quitting the study during the study period.

Statistical Analysis

Data were analyzed using SPSS for Windows version 23.0. Categorical variables were expressed as fre- quencies (n) and percentages (%). Continuous variables were expressed as mean, standard deviation (SD), median, and minimum- maximum values. Normal distribution of continuous variables was assessed using the Kolmogorov-Smirnov test. Categorical variables were compared using Chi-square test. Independent groups were compared using Mann-Whitney U test and Student's t-test. Differences among measurements were assessed using Friedman's test. A p value of <0.05 was considered significant.

RESULTS:

The control group (local anaesthesia alone) included 5 patients with a mean age of 42 ±10.31 years and the experimental group (conscious sedation + local anaesthesia) included 5 patients with a mean age of 48.06 ± 11.54 years, (Table 1). The VAS scores decreased significantly on days 2 and 7 in both groups (p<0.0001), (Table 2). Moreover, the VAS scores were significantly lower in the experimental group compared to the control group in all three measurements (p<0.05), (Table 2).

A significant difference was found between the two groups with regard to their responses in the satisfaction questionnaire (p<0.0001), whereby 80% of the patients in the experimental group replied as “Absolutely yes” and most of the patients in the control group replied as “No” and “Maybe”, 60% and 20% respectively (Table 3).

DISCUSSION:

During oral surgical procedures, some patients discontinue treatment due to dental anxiety or difficulties communicating with their doctors [8]. In addition, the increased likelihood of pain after surgery may make patients feel uneasy and anxious to proceed with the treatment protocols [9]. Likewise, the current review assessed the impact of conscious sedation on postoperative anxiety and patient satisfaction.

In a past study conducted by Nakanishi et al. administration of 0.025, 0.05, and 0.075 mg/kg of midazolam to three distinct experimental groups, respectively, and saline alone to the control group, respectively, to examine the effects of midazolam on tactile and pain sensations on the skin of the chin. In patients treated with 0.05 and 0.075 mg/kg midazolam, the authors found that midazolam increased the threshold of perception of tactile and painful stimuli in addition to providing sedation, whereas 0.025 mg/kg midazolam did not alter tactile or painful sensations [10]. In our study, the experimental group was given Inj. Midazolam 0.025mg/kg IV and Inj. Propofol 0.5mg/kg IV to see how it affected them.

Ong et al. administered midazolam with local anaesthesia in the experimental group and local anaesthesia alone in the control group to patients undergoing wisdom tooth extraction to examine the connection between conscious sedation and pain [11]. The authors discovered that the experimental group required more postoperative analgesia and had less postoperative pain than the control group.

Ozgul et al looked into the effect of conscious sedation on the comfort of the patient after an impacted wisdom tooth extraction [12]. They found that the sedation with 0.06 mg/kg midazolam reduced pain and edema compared to the control group and made the patient feel comfortable both before and after the procedure. Wilson et al evaluated the pain and anxiety levels of conscious sedation-assisted tooth extraction patients and found that those who received conscious sedation in addition to local anaesthesia had lower levels of both than those who received local anaesthesia alone [13].

In both measurements, the experimental group's VAS scores were significantly lower than those of the control group in our study. Cagiran et al compared the effects of conscious sedation with intravenous midazolam on hemodynamics and patient and physician satisfaction in patients undergoing implant surgery under local anaesthesia for the administration of local anaesthesia with midazolam sedation and local anaesthesia alone [14].

Majority of patients in the experimental group responded "Absolutely yes" when asked if they would prefer to repeat the procedure, while the majority of patients in the control group responded "No" and "Maybe" when asked the same question. Based on these findings, we believe that patients who undergo closed reduction of maxillofacial trauma under local anaesthesia prefer to have conscious sedation administered. In contrast, our results were comparable to those of Dhuvad et al, [15]Ozgul and Or, despite their differences from Cagiran et al. who discovered that there was no significant difference in satisfaction between the two anesthetic methods for both the patient and the physician. The differences in the surgical methods, the difficulties associated with their administration, and the criteria utilized in the studies to assess patient satisfaction could all account for this variation.

For the present and future of mandibular fracture management, the oral and maxillofacial surgical team must have a sufficient understanding of the physiology of fracture healing, multiple closed reduction techniques, and anatomy.

Although it is more expensive than local anaesthesia, conscious sedation can have numerous advantages for oral surgical procedures in terms of patient and physician comfort. A team of a dentist or maxillofacial surgeon, anesthesiologist, nurse, and auxiliary staff is required for conscious sedation. In addition, the procedures ought to be carried out in a hospital setting for pre- and post-operative monitoring of the patient's vital signs, such as temperature, pulse rate, and blood pressure. When compared to local anaesthesia, oral surgical procedures performed under conscious sedation require more time and cost more [13].

CONCLUSION:

Conscious sedation is a method for dealing with dental phobia; it should not be used in place of good behavioral management or effective local anaesthesia. The drug and the route of administration should be chosen for each patient individually. It is impossible to overstate the significance of a thorough pre-sedation assessment and the importance of staff with adequate training in an area with adequate monitoring tools. It is essential to be aware of the limitations when using sedation in a dental setting. Patients frequently opt for conscious sedation while getting their dental treatment because of pain, anxiety, and fear. In oral surgery, sedation in conjunction with local anaesthesia is increasingly being utilized as an alternative to local anaesthesia alone for the management of perioperative pain and anxiety.

Tables:

Table 1: Age characteristics

	Experimental group (n) Mean + SD Med.	Control group (n) Mean + SD	p
Age (years)	(n=5: Male-4 Female-1) 48.06 + 11.54	(n=5: Male-2 Female-3) 42.62 + 10.31	0.020

Student's t-test SD: Standard deviation

Table 2: VAS scores

Group	Day 2 (n) Mean+SD	Day 7 (n) Mean+SD	Day 14 (n) Mean+SD	p*
Experimental	(n=5) 2.83+2.71	(n=5) 1.06+1.69	(n=5) 0.43+1.21	p<0.0001
Control	(n=5) 5.86+2.42	(n=5) 2.74+2.11	(n=5) 0.925+1.89	p<0.0001
p**	p<0.0001	p<0.0001	p=0.010	

* Friedman's test
** Mann-Whitney U test
VAS: Visual Analogue Scale, SD: Standard deviation

Table 3: Relationship between the groups and questionnaire replies

	Groups	

	Experimental (%)	Control (%)	p
Absolute Yes	4 (80%)	1 (20%)	p<0.0001
Maybe	0	1 (20%)	
No	1 (20%)	3 (60%)	p<0.0001

Chi-square analysis

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