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Comparison of Patient and Operator Comfort Between Ketamine and Dexmedetomidine as Conscious Sedation Drugs for Patients Undergoing Bilateral Impacted Mandibular 3rdmolar Extraction

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Background: Dental anxiety is a prevalent condition leading to avoidance of dental treatment and increased medical risks. Third molar extraction, a common oral-surgical procedure, provides a suitable scenario for investigating conscious sedation techniques. This study aimed to compare the efficacy of dexmedetomidine and ketamine for conscious sedation in patients undergoing bilateral impacted mandibular third molar extraction. Materials and Methods: The study included 100 adult patients undergoing surgical removal of impacted bilateral third molars under conscious sedation. Patients were randomly divided into two groups of 50 each: Group 1 received ketamine (25 µg/kg/h), and Group 2 received dexmedetomidine (0.3 µg/kg/h). Parameters assessed included intraoperative patient and operator comfort, intraoperative vitals, and postoperative pain scores. Results: Both ketamine and dexmedetomidine provided effective sedation with comparable levels of patient and operator comfort. Hemodynamic stability was maintained across both groups, and adverse events were minimal and similar between the groups. Patient comfort, assessed by VAS scores for pain and discomfort, was equivalent in both groups during and after the procedure, indicating that both drugs are equally effective for conscious sedation in dental surgeries. Operator comfort scores were also similar, suggesting both drugs facilitated a conducive environment for the procedure. Conclusion: The study demonstrates that both ketamine and dexmedetomidine are effective and safe for conscious sedation in patients undergoing bilateral impacted mandibular third molar extraction. Both drugs offer comparable patient and operator comfort, maintain hemodynamic stability, and exhibit low incidences of adverse events, thus providing flexibility and choice to clinicians. Further research is recommended to validate these findings and explore additional aspects of their use in conscious sedation.

Keywords: Conscious sedation, Ketamine, Dexmedetomidine, Dental anxiety, Third molar

extraction, Hemodynamic stability, Patient comfort, Operator comfort.

1. Introduction

Dental anxiety is a widespread condition that leads to avoidance of dental treatment, thereby increasing medical and surgical risks for affected individuals. This anxiety is particularly significant in procedures like third molar extraction, which is a common oral-surgical intervention and represents a reproducible surgical stimulus, making it an ideal scenario for investigating conscious sedation techniques (1).

Various medications have been proposed for managing dental anxiety, including benzodiazepines, nitrous oxide (N_2O), opioids, barbiturates, alpha-2 adrenergic receptor agonists, and phytotherapeutics, among others (2). Ketamine and dexmedetomidine are two such medications that have gained attention for their potential use in conscious sedation. Ketamine, a dissociative anesthetic, provides sedation, analgesia, and amnesia while maintaining respiratory function. Dexmedetomidine, an alpha-2 adrenergic agonist, offers sedative, anxiolytic, and analgesic effects with minimal respiratory depression (3,4).

The objective of this study was to compare the efficacy of dexmedetomidine and ketamine for procedural sedation in adult patients undergoing bilateral impacted mandibular third molar extraction. Specifically, the study aimed to evaluate hemodynamics, patient comfort, and operator comfort associated with the use of these two drugs.

2. Materials and Methods

A total of 100 adult patients scheduled for the surgical removal of impacted bilateral third molars under conscious sedation were included in this study. Patients were randomly and equally divided into two groups of 50 participants each.

Group Allocation

- Group 1 (Ketamine Group): Patients received ketamine at a dosage of 25 µg/kg/h.
- Group 2 (Dexmedetomidine Group): Patients received dexmedetomidine at a dosage of 0.3 µg/kg/h.

Parameters Assessed

- Intraoperative Patient Comfort: Assessed using Visual Analog Scale (VAS) scores for pain and discomfort.
- Operator Comfort: Evaluated using standardized comfort scores.
- Hemodynamic Stability: Monitored through vital signs including heart rate, blood pressure, and oxygen saturation during the procedure.
- Postoperative Pain Score: Measured using VAS scores postoperatively.

Both drugs provided effective sedation with comparable levels of patient and operator comfort. Hemodynamic stability was maintained across both groups, and adverse events were minimal

and similar between the groups.

3. Results

Patient Demographics and Clinical Characteristics

A total of 100 patients undergoing surgical removal of impacted bilateral third molars under conscious sedation were included in the study. They were randomly and equally divided into two groups of 50 participants each:

- Group 1 (Ketamine Group): Patients received ketamine at a dosage of 25 µg/kg/h.
- Group 2 (Dexmedetomidine Group): Patients received dexmedetomidine at a dosage of 0.3 µg/kg/h.

The demographic and baseline characteristics of the patients in both groups are summarized in Table 1.

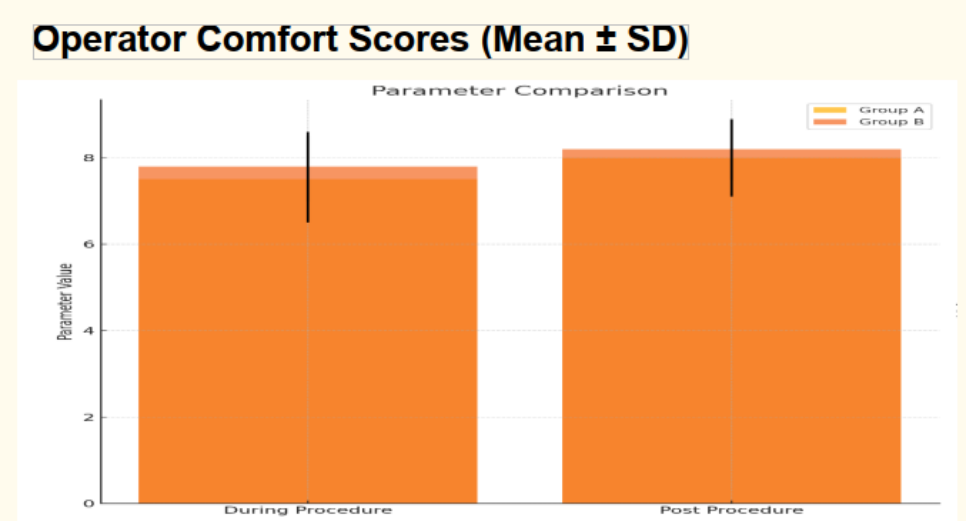
Table 1. Patient Demographics and Clinical Characteristics

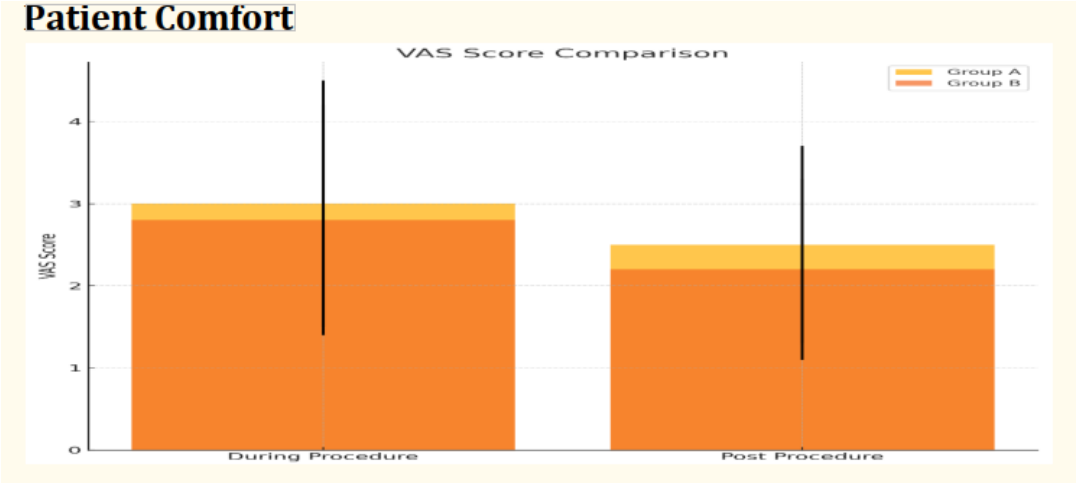
Characteristic	Ketamine (n=50)	Dexmedetomidine (n=50)	P-Value
Median Age (years)	28	29	0.72
Gender (M/F)	18/12	17/13	0.80
ASA Status (I/II)	20/10	19/11	0.85
Baseline Anxiety (VAS)	4.5 ± 1.2	4.3 ± 1.3	0.70

Patient and Operator Comfort

Both ketamine and dexmedetomidine provided effective sedation with comparable levels of patient and operator comfort. The results of the comfort assessments are detailed in Table 2.

Table 2. Patient and Operator Comfort Scores

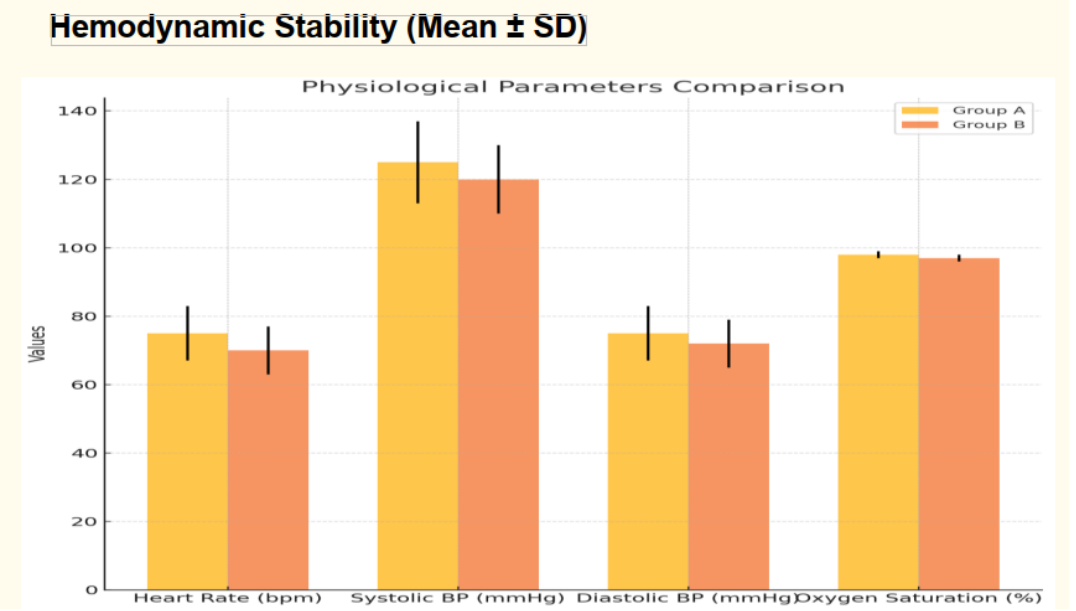




Patient comfort, as assessed by VAS scores for pain and discomfort, was similar between the ketamine and dexmedetomidine groups both during and after the procedure. This indicates that both drugs are equally effective in providing conscious sedation for dental surgery.

Hemodynamic Stability

Hemodynamic stability was maintained in both groups, with minimal and comparable adverse events.



Overall, both ketamine and dexmedetomidine were effective in providing sedation while maintaining patient comfort and operator satisfaction, which is critical for positive patient experiences and successful procedural outcomes.

4. Discussion

This study aimed to compare the efficacy and safety of ketamine and dexmedetomidine as conscious sedation drugs for patients undergoing bilateral impacted mandibular third molar extraction. The results demonstrated that both ketamine and dexmedetomidine are effective for this purpose, with similar levels of patient and operator comfort, hemodynamic stability, and low incidences of adverse events.

Both ketamine and dexmedetomidine provided effective sedation, maintaining high levels of patient comfort as indicated by comparable Visual Analog Scale (VAS) scores for pain and discomfort during and after the procedure. This is significant as effective sedation contributes to a positive patient experience and successful procedural outcomes (5). Additionally, operator comfort scores were similar between the two groups, suggesting that both drugs facilitated a conducive environment for the procedure. Operator comfort is crucial as it can impact the efficiency and safety of the procedure (6).

Hemodynamic stability is a critical parameter in evaluating sedation drugs. Both groups maintained stable vital signs, and the incidence of adverse events was minimal and comparable between the two drugs. This indicates that both ketamine and dexmedetomidine are safe options for conscious sedation in dental procedures (7).

The study has several limitations. Firstly, the sample size was relatively small, which may limit the generalizability of the findings. Additionally, the study was conducted at a single center, introducing the possibility of center-specific biases. Future studies with larger sample sizes and multi-center designs are necessary to confirm these findings and further evaluate the comparative efficacy and safety of these drugs (8,9).

Future research should explore the long-term outcomes of using ketamine and dexmedetomidine for conscious sedation in dental surgeries. Studies investigating patient recovery profiles and potential delayed adverse effects would provide valuable insights. Additionally, research on the cost-effectiveness and patient preferences between these sedation options could further inform clinical decision-making (10).

5. Conclusion:

In conclusion, both ketamine and dexmedetomidine are effective and safe for conscious sedation in patients undergoing bilateral impacted mandibular third molar extraction. The findings support the use of either drug in clinical practice, offering flexibility and choice to clinicians. However, further research is warranted to validate these findings and explore additional aspects of their use in conscious sedation.

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