SEDATION DURING IMPLANT SURGERY

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Abstract

Medical dentistry treatments take the form of practical applications rather than the use of medical therapies. Performing procedures under local anaesthesia can inhibit pain in patients but does not prevent fear and the physiological reactions that occur in response to it. This may affect the success of treatment. The use of implant surgery, one of the practical applications of medical dentistry, has been increasing gradually over the last 20 years. In order to perform surgery comfortably and prevent fear in patients during the procedure, sedation is established. In this article, we present the sedative agents administered during implant surgery and their usage.

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Introduction

In implant surgery, ensuring cooperation of the patient is one of the most important criteria for success. During the procedure, insertion of the implant into a convenient position and ensuring that surgery is completed within the desired time depend on the cooperation of the patient. Previous unfavorable experiences of dental experiences as well as the sound and appearance of the instruments used can increase anxiety in patients and may lead to physiological reactions related to fear and stress. Therefore, nowadays, several sedative drugs are utilized to induce amnesia during implant surgery.

During this application, which is referred to as conscious sedation, the patient maintains continuously open airway but cannot respond to physical stimulation or verbal commands [1, 2]. During deep sedation, the level of consciousness can also be controlled; this is a situation in which the protective reflexes are partially lost but the patient can respond insufficiently to verbal commands. Unlike sedation, general anesthesia can be summarized as a situation in which the level of unconsciousness can be controlled, the reflexes of the patient are completely lost, the patient cannot protect their own airway, and the patient cannot respond to stimuli [3].

In implant surgery, conscious sedation is mostly sufficient. During conscious sedation, attention must be paid to the doses of the drugs to be used for sedation, the indications for their use, whether the patient has any respiratory system disorder, the systemic situation of the patient (e.g., diabetes, hypertension), history of allergy, and whether the patient has had any recent upper respiratory tract infections.

Indications for conscious sedation:

- Slight anxiety
- Surgeries that can last for a moderate or longer duration
- Patients with excessive nausea reflex

Contraindications:

- Patients with severe systemic disorders
- Chronic obstructive pulmonary disease (COPD)
- Obesity
- Bleeding problems

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- Gastrointestinal tract obstruction
- Depression, tranquilizer drug use

Furthermore, according to the classification of the American Society of Anesthesiology (ASA), patients in ASA groups I and II are suggested as suitable for the application of conscious sedation.

ASAI	No systemic disease
ASAII	Well controlled systemic disease
ASA III	Moderately controlled systemic disease
ASA IV	Poorly controlled systemic disease
ASA V	Patients with vital risk
E	Patient requiring immediate intervention

Table 1. American Society of Anesthesiology (ASA) classification of patient status [4]

Before applying sedation, a complete and detailed anamnesis should be taken from the patient. All physical and laboratory examinations should be performed in detail. The respiratory and cardiovascular systems of the patient should be investigated during physical examination. The opening of the airway should be checked. Although the specific indications for implant surgery show parallelism to the application of sedation, examination and anamnesis should be detailed for the surgical procedures to be applied under sedation. Complete and correct indication should be maintained.

The sedative agents used in implant surgery are the same as the agents used in other medical dentistry practices. However, the duration of the procedure and the oral region where the procedure is performed affect drug selection. The drugs used can be administered by oral, inhalation, intranasal, intravenous (IV), intramuscular, rectal, or sublingual routes [5].Since implant surgery usually has a longer duration and involves adult patients, the IV route is preferred. Furthermore, IV drugs have many advantages such as a quick onset of action, the ability to adjust dosage with respect to the need of the patient, the ability to ensure slight, moderate, and deeper levels of sedation easily and immediately by means of the IV route, and the ability to administer antagonist drugs [6, 7]. The primarily IV agents used for conscious sedation are as follows.

Benzodiazepines

Benzodiazepines are the most commonly preferred agents among the IV sedatives used in implant surgery. They act to enhance the effects of gamma amino butyric acid (GABA) receptors, which play a role in neural transmission. Benzodiazepines have anxiolytic, anticonvulsant, sedative, myorelaxant, and amnesic actions. They do not have analgesic effects. The most used benzodiazepines are midazolam (Dormicum) and diazepam (Diazem). Since they cause less somnolence, they have a wider confidence interval and due to their amnesic effects, they are frequently preferred for conscious sedation [8].

Diazepam: Diazepam is used as a premedication agent in many of the practical applications of medical dentistry. It is very effective as an anxiolytic. Its adult IV dose is between 0.04 and 0.2 mg/kg. Dizziness, amnesia, and loss of consciousness occur in the patient, respectively. Sedation begins 3 to 5 minutes after injection and its half-life is extremely long (32 to 90 hours) [8]. Diazepam causes hypotension and vertigo. Furthermore, the airway should be under control continuously during administration. When diazepam is administered via the IV route, anterograde amnesia develops in the patient [9, 10].

Midazolam: Midazolam was the first benzodiazepine derivative to be synthesized, and was created in 1976 by Fryer and Walser [11]. It is a commonly preferred agent for sedation due to its different available administration routes, rapid onset of action, shorter elimination half-life, and minimal effect on the recovery period. Since midazolam is a stronger sedative, it should be given slowly. A 2-minute or longer administration time is suitable. A single larger bolus dose should never be administered. Quick and excessive IV doses may result in respiratory depression and arrest. f this situation is not detected and treated immediately, it may result in hypoxic encephalopathy and death. The IV dose of midazolam is 0.01 to 0.1 mg/kg, but it should not exceed 2.5 mg in healthy adults. The most important indicator of a sufficient dose is inapprehensible slurred speech. The side effects that can occur following IV administration of midazolam are hiccups, nausea, vomiting, excessive sedation, headache, coughing, and pain at the injection site[9].

Narcotics (Opioids)

Opioid drugs are classified as stronger analgesics. They are used for pain that cannot be controlled by means of non-opioid drugs such as myocardial infarction, terminal cancer pain, bone fractures, and pain resulting from burns. The essential opioids are morphine, eperidine, fentanyl, and alfentanyl. Opioids can be natural or synthetic compounds [12-16]. They are not commonly used in medical dentistry and are mostly utilized to reinforce the influence of benzodiazepines.

Propofol

Propofol (2,6-diisopropylphenol) is a preferred agent for sedation, particularly in same-day patients due to its wider distribution volume, higher tissue affinity, quick rate of clearance, and the fact that it provides an earlier and better recovery. It has been reported that 0.25 to 1mg/kg bolus and 1 to 4 mg/kg/hr infusion doses of 2,6-propofol are sufficient to ensure sedation [17]. Propofol may lead to either cardiovascular or respiratory depression; therefore, it is not used in the practice of medical dentistry[18].

Ketamine

Being a phenylcyclidine derivative, ketamine is a rapidacting, non-narcotic, non-barbiturate agent that has a broad safety margin [19].The anaesthesia induced by ketamine is referred to as dissociative anaesthesia. In dissociative sedation, twitching eye movements are observed and corneal and light reflexes are maintained; however, patients do not respond to visual or painful stimuli.There are many side effects of ketamine.It depresses the cardiovascular system and increases the arterial blood pressure, heart rate, and muscle tonus. When recovering from dissociative sedation, the patient is agitated and may experience hallucinations. Indeed, hallucination is a commonly observed side effect of ketamine [20].

Conclusion

Conscious sedation under local anaesthesia may have side effects such as hypoventilation, hypercapnia, and airway obstruction[21]. In order to detect the complications of sedative drugs during and following their use, as well as to obtain patient monitoring records, patients should be monitored bypulse oximetry, electrocardiography, and blood pressure measurement. Following the procedure, patients should also be monitored in the post-operative short-stay unit, and should be discharged from the hospital with an adult [22]. The surgeon should decide carefully which surgical intervention and which sedative agent should be used for oral surgery. The convenient sedative agent should be administered taking into consideration the duration of the procedure and the pain that may be induced.

Declaration of Interest

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