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Клиническая практика и обучение внутривенной умеренной/ глубокой седации в Японии

Резюме. Безопасность и комфорт во время стоматологических процедур являются ключевыми факторами для оказания качественной медицинской помощи и основой для удовлетворенности пациентом стоматологическим лечением. В Японии широко применяются такие виды обезболивания, как общее обезболивание, модулируемая и глубокая седация на амбулаторном стоматологическом приеме для обеспечения безопасного и комфортного лечения. Для внутривенной седации мидазолам, пропофол и их комбинация являются обычным выбором для стоматологов. Иногда клиническая ситуация требует использования лекарственных препаратов, обеспечивающих глубокую седацию, особенно у пациентов с нарушениями ментального здоровья, выраженным страхом или тревожностью, а также с сильным рвотным рефлексом. Поэтому некоторые из этих пациентов могут подвергаться общей анестезии вместо внутривенной

седации. В 2017 г. Японское стоматологическое общество анестезиологов (JDSA) разработало «Практические рекомендации по внутривенной седации в стоматологии», которые являются стандартом для повседневной клинической практики. В Японии врачи-стоматологи учатся 6 лет, из которых на первых 4 слушают лекции и проходят доклинические практики, а с V курса приступают к клиническим дисциплинам. Студенты изучают широкий спектр дисциплин и получают навыки системного ведения стоматологических пациентов. Автор ожидает развития сферы стоматологической анестезиологии в России и развития системы сотрудничества в области анестезиологии в стоматологии и медицине.

Ключевые слова: внутривенная седация, клиническая практика, образование, медицинское право

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Clinical practices and education of intravenous moderate/ deep sedation in Japan

Abstract. Safety and comfort during dental procedures are the key factors for high quality dentistry and fundamentals for patient satisfaction. Systemic managements such as general anesthesia and moderate/deep sedation are widely applied to dental outpatients for safe and comfortable dentistry by dentists in Japan. For intravenous moderate sedation, midazolam, propofol and their combination are common choices for dental outpatients. Sometimes deep sedation is required especially in patients with intellectual disability, severe fear/anxiety or severe gagging reflex. Some of these patients may undergo general anesthesia instead of intravenous sedation. The Japanese Dental Society of Anesthesiology (JDSA) established "Practice Guidelines for Intravenous Conscious Sedation in Dentistry" in 2017, and these guidelines become standard

for routine clinical practices. In Japan, dental school has 6-year curriculum. Lectures and preclinical practices are given to 4th grade students and clinical practices are to 5th grade students. They learn wide range of knowledge and skills for systemic management of dental patients. JDSA has two board systems for dental anesthesiologists; Japanese Board of Dental Anesthesiology (JBDA) and Board Certified Dental Anesthesiology Specialist (BCDAS). BCDAS is authorized by the Ministry of Health, Labour and Welfare, Japan since 2006. The author would expect the development of dental anesthesiology field in Russia and the progress of anesthesiology collaboration system in dental and medical field.

Key words: intravenous sedation, clinical practices, medical legislation

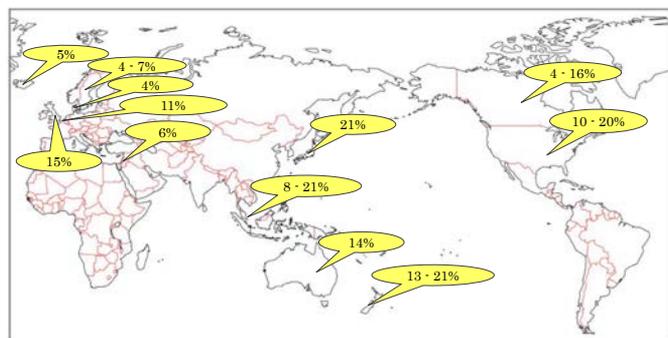


Fig. 1. Prevalence of Fear and Anxiety toward Dentistry [1]

The older population is growing in many countries. About 28% of citizens become geriatric in 2020 in Japan. It is called "super-aged" society. In Russia, about 15% of citizens are geriatric in 2020 and it is estimated that more than 20% of citizens will be in 2050. Geriatric people have many medical disorders. Therefore, physical and psychological stresses during dental treatments sometimes worsen their systemic condition. In addition, there may be 5 to 20% of citizens who have strong fear and anxiety toward dental treatment (Fig. 1) [1]:

- 1) Such people will easily develop syncope or hyperventilating condition during dental treatment. Fear and

anxiety toward dental treatment may enhance pain during treatment, and enhanced pain may aggravate fear and anxiety.

2) Thus, a vicious cycle between fear/anxiety and pain will develop.

To ensure safety and comfort during dental procedures in these patients, it is quite important that dentists should continue to develop knowledge and skills on systemic management and pain relief of dental patients. Safety and comfort during dental procedures are the key factors for high quality dentistry and fundamentals for patient satisfaction.

In Japan, systemic managements such as general anesthesia and moderate/deep sedation are widely applied to dental outpatients for safe and comfortable dentistry by dentists. In this short review, the present condition of clinical practices and education of systemic management, especially intravenous sedation in Japan is reported.

LEGAL BACKGROUND IN DENTISTRY IN JAPAN

In Japan, there are two independent laws: medical practitioner's law and dental practitioner's law. Dentists are in charge of dental treatment, oral and maxillofacial surgery and related activities that are necessary to perform wide range of dental practices such as general anesthesia and moderate/deep sedation. As a result, dentists devoted to the field of systemic management including general anesthesia and moderate/deep sedation have formed a group of "dental anesthesiologists". Their main practices consist of systemic management, pain clinic and emergency treatment of dental patients. Dental anesthesiology specialist system has become authorized by the Ministry of Health, Labour and Welfare, Japan in 2006.

About 2,500,000 general anesthesia are given in the medical and dental field in one year in Japan. Of those, about 13,000 cases are given in 29 dental schools. In addition, about 100,000 intravenous moderate/deep sedation are given in the dental field in one year in Japan. Of those, about 30,000 cases are given in 29 dental schools. Most of these cases are given by dental anesthesiologists. In Tokyo Dental College, 6,000 to 7,000 intravenous moderate/deep sedation cases are performed in one year; more than one fifth of total cases in dental schools (Fig. 2). All staffs working at the Department of Dental Anesthesiology, Tokyo Dental College are dentists.

In Tokyo Dental College, there are few cases of inhalation sedation because its sedative effect is feeble and sometimes uncertain compared with intravenous moderate/deep sedation.

COMMON AGENTS FOR INTRAVENOUS MODERATE/DEEP SEDATION AND THEIR INDICATIONS

Several agents have been applied to intravenous moderate/deep sedation in Japan. Of those, midazolam, propofol and dexmedetomidine are most common. However, dexmedetomidine requires long recovery period and is difficult for dentists to use for outpatients. Thus, midazolam, propofol

and their combination are common choices for intravenous moderate/deep sedation for dental outpatients.

The reasons why the agent is selected are diverse among many kinds of patients. For example, suppression of hemodynamic fluctuation is important in the dental treatment of medically compromised patients such as patients with hypertension and/or ischemic heart disease. Mitigation of fear/anxiety is important for phobic dental patients. Control of body movement is important for patients with intellectual disability and/or cerebral palsy (Fig. 3) [3]. As a result, midazolam, propofol or midazolam/propofol combination is used according to patient's condition. Fundamentally, the target level of intravenous sedation is moderate; the patient is conscious but has no or minimal fear/anxiety about dental treatment. However, sometimes deep sedation is required especially in patients with intellectual disability, severe fear/anxiety or severe gagging reflex. Some of these patients may undergo general anesthesia instead of intravenous sedation (table on next page) [4].

GUIDELINES AND STATEMENTS FOR INTRAVENOUS MODERATE/DEEP SEDATION

There are several guidelines and statements for intravenous moderate/deep sedation:

1. ASA Practice Guidelines for Moderate Procedural Sedation and Analgesia 2018;
2. ASA Statements on Sedation & Anesthesia Administration in Dental Office-Based Settings (2017);

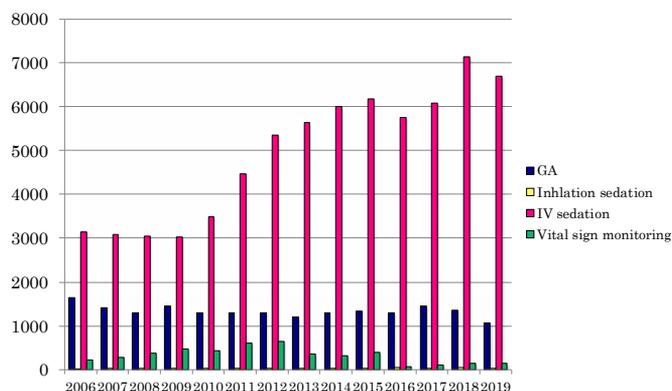


Fig. 2. Clinical Activities in Tokyo Dental College (Suidobashi Hospital and Chiba Dental Center)

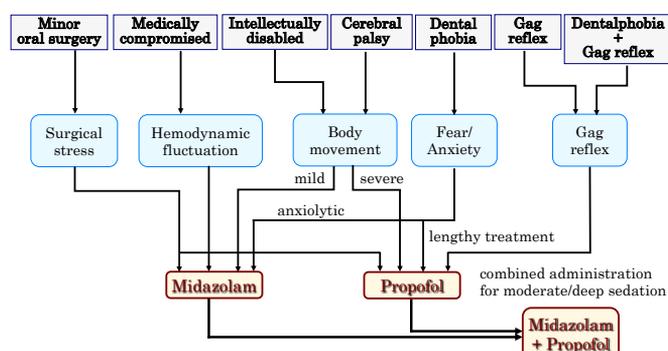


Fig. 3. Drug Selection for Intravenous Sedation [3]

Continuum of Depth of Sedation Definition of General Anesthesia, and Levels of Sedation/Analgesia

	Minimal Sedation (Anxiolysis)	Moderate Sedation/Analgesia (Conscious Sedation)	Deep Sedation/Analgesia	General Anesthesia
Responsiveness	Normal response to verbal stimulation	Purposeful response to verbal or tactile stimulation	Purposeful response after repeated or painful stimulation	Unarousable, even with painful stimulus
Airway	Unaffected	No intervention required	Intervention may be required	Intervention often required
Spontaneous Ventilation	Unaffected	Adequate	May be inadequate	Frequently inadequate
Cardiovascular Function	Unaffected	Usually maintained	Usually maintained	May be impaired

- 3. JDSA Practice Guidelines for Intravenous Conscious Sedation in Dentistry (2017);
- 4. ADA Guidelines for the Use of Sedation and General Anesthesia by Dentists (2016);
- 5. ASA Guidelines for Office-Based Anesthesia (2014).

The Japanese Dental Society of Anesthesiology (JDSA) established “Practice Guidelines for Intravenous Conscious Sedation in Dentistry” in 2017 [5]. These guidelines have 21 clinical questions; 7 for preoperative management, 11 for intraoperative management, 3 for postoperative management.

Preoperative Management

- 1. How should the general status of the patient be assessed?
- 2. What are the indications/contraindications of intravenous sedation?
- 3. Are routine preoperative screening tests (ie, hematologic tests, chest radiography electrocardiography) necessary?
- 4. How to provide a description of the procedure and obtain consent (informed consent) from patients?
- 5. Is preoperative oral intake restriction necessary?
- 6. If so, what type of restriction is necessary?
- 7. What education and training are necessary for intravenous sedation?
- 8. What are the skills needed to administer sedatives intravenously?

Question: What education and training are necessary for intravenous sedation?

Recommendation: To safely perform intravenous sedation, it is necessary to receive training in anesthetic pharmacology, anesthesia technique, systemic physical management, and emergency resuscitation (degree of recommendation: “A” evaluated by the Working Group on Guidelines Development).

Question: What are the skills needed to administer sedatives intravenously?

Recommendation: Sedatives are administered continuously or intermittently during intravenous sedation. In addition, in some cases, administration of an inotrope or emergency drugs may be required during patient management. Therefore, during sedation, it is necessary to pay attention to complications that arise from venous access itself and acquire the necessary skills to prevent them (degree of recommendation: “A” evaluated by the Working Group on Guidelines Development).

Intraoperative Management

- 1. Can the practitioner performing intravenous sedation also perform the dental treatment?
- 2. How long is the treatment duration under intravenous sedation?
- 3. What intraoperative complications may occur?
- 4. When establishing intravenous access, what are the points to consider to avoid nerve damage?
- 5. Is it possible to improve the safety of intravenous sedation through monitoring?
- 6. Is it useful to select drugs according to the purpose of performing intravenous sedation?
- 7. Is it possible to increase the safety of intravenous sedation if titration is performed?
- 8. Is it useful to use an antagonist for intravenous sedation?
- 9. Is preparation for oxygen administration necessary during intraoperative management of intravenous sedation?
- 10. Does intraoperative sedation management require preparation of emergency equipment?
- 11. Does intraoperative management of intravenous sedation require acquisition of airway management and resuscitation skills?

Postoperative Management

- 1. How can recovery from intravenous sedation be evaluated?
 - 2. What are the indications for allowing the patient to be discharged home after intravenous sedation?
 - 3. How should postoperative complications be monitored?
- Here, two relevant clinical questions and their recommendations for preoperative management are quoted.

UNDERGRADUATE AND POSTGRADUATE EDUCATION OF SYSTEMIC MANAGEMENT OF DENTAL PATIENTS

Here, the undergraduate curriculum of dental anesthesiology in Tokyo Dental College is shown as a sample of education curriculum given in Japanese Dental Schools. In Japan, dental school has 6-year curriculum. Lectures and preclinical practices are given to 4th grade students. There are 28 lectures in one year and one lecture is 85 minutes long. Lectures include:

- 1) fundamentals for systemic management,
- 2) local anesthesia,

- 3) inhalation and intravenous sedation,
- 4) general anesthesia,
- 5) ambulatory anesthesia,
- 6) anesthesia management for pediatric, geriatric, and disabled patients,
- 7) systemic complications,
- 8) basic life support and emergency care, and
- 9) pain clinic and palliative medicine.

Students also participate in preclinical practices including:

- 1) infiltration and conduction anesthesia using a simulator,
- 2) vital sign measurements with each other,
- 3) venous cannulation using a simulator, and
- 4) basic life support using a simulator.

Fifth grade students participate in clinical practices and they experience:

- 1) infiltration and conduction anesthesia with each other,
- 2) vital sign monitoring of dental patients,
- 3) venous cannulation with each other,
- 4) basic life support using a simulator, and
- 5) artificial ventilation of anesthetized patients.

These are the fundamental curricula for dental students in Japan and the Japanese national examination for dentists requires all area of the knowledge of dental anesthesiology given in the lectures shown above.

After passing the national examination, they should take residency for general dentistry for one year. After that, 4 to 5 dentists enter the Department of Dental Anesthesiology, Tokyo Dental College every year. They are mainly postgraduate students. In the first year, they receive general anesthesia training. They learn basic concept of systemic management and several anesthesia skills such as venous cannulation, artificial ventilation, tracheal intubation, and drug administration through general anesthesia. In the second year, they receive training of intravenous sedation as well as general anesthesia. Note that the trainees start the training of intravenous sedation after one-year training of general anesthesia. Intravenous sedation, especially deep sedation, is sometimes more dangerous than general anesthesia because of difficulty of airway management. In addition, they receive pediatric medical anesthesia training in a pediatric hospital. In the third year, they take the examination of Japanese Board of Dental Anesthesiology (JBDA) and are qualified as JBDA. In the fifth year, they receive

medical anesthesia training for 1 to 2 years in a university general hospital. Then, many of them take the examination of Board Certified Dental Anesthesiology Specialist (BCDAS), which is authorized by the Ministry of Health, Labour and Welfare, Japan and qualified as BCDAS.

Board system of the Japanese Dental Society of Anesthesiology

JDSA has two board systems for dental anesthesiologists. The first step is the JBDA qualification. To become JBDA, dentists should receive at least 2-year training, experience at least 200 general anesthesia cases and 50 intravenous cases, have academic activities, and be certified as an American Heart Association Basic Life Support Provider. Then, they take paper and oral examinations. Now, there are 1,329 JBDA members.

The second and advanced step is the BCDAS qualification. To become BCDAS, dentists should receive at least 5-year training, experience at least 500 systemic management cases including general anesthesia and intravenous sedation, have academic activities, and be certified as an American Heart Association Advanced Cardiac Life Support Provider. Then, they take paper and oral examinations. Now, there are 316 BCDAS members.

CONCLUSION

In Japan, dental anesthesiologists have been working in the field of general anesthesia and intravenous moderate/deep sedation for safe and comfortable dentistry. However, to achieve this purpose, continuous support by medical anesthesiologists has been quite important, because even if dental anesthesiologists give intravenous moderate/deep sedation, general anesthesia training is indispensable and medical anesthesiologists can propose wide range of training field to dental anesthesiologists. Japanese medical anesthesiologists have realized the significance of safe and comfort dentistry for many years and they have been supporting the activity of dental anesthesiologists. This is the Japanese anesthesiology collaboration system in dental and medical field. The author would expect the development of dental anesthesiology field in Russia and the progress of anesthesiology collaboration system in dental and medical field in Russian style.

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