Intranasal Premedication With Dexmedetomidine in an Adult Patient With Intellectual Disabilities: A Case Report

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Recently, intranasal dexmedetomidine (DEX) has been reported to be effective as a preanesthetic medication, mostly in healthy pediatric patients. We attempted to administer intranasal DEX premedication in this case to an adult patient with intellectual disability who previously had difficulty tolerating premedication with oral midazolam. Using an intranasal atomization delivery device (MAD Nasal, Teleflex), we administered 1.5 μg/kg of DEX intranasally and were able to achieve adequate sedation, which facilitated a smooth mask induction of general anesthesia with sevoflurane. Premedication with intranasal DEX may be a useful method for enabling induction of general anesthesia in adult patients with intellectual disabilities.

Key Words: Dexmedetomidine; Premedication; Intranasal administration.

Recently, intranasal dexmedetomidine (DEX) has been reported to be effective as an anesthesia premedication.[1] However, most studies involved healthy pediatric patients, and none involved adult patients. We present a case report in which premedication using intranasal DEX was successfully performed for an adult patient with intellectual disability (ID).

CASE PRESENTATION

The patient was a 27-year-old woman (height, 150 cm; weight, 48.5 kg; body mass index, 21.6 kg/m^2) with ID, epilepsy, and autism spectrum disorder who was scheduled for dental treatment under general anesthesia due to her inability to cooperate sufficiently. She had previously undergone general anesthesia for dental treatment several times, during which oral midazolam had been used for premedication. However, it was becoming more difficult to obtain her cooperation using the oral midazolam-based premedication. Therefore, we decided to try premedication using intranasal DEX.

On the first occasion, intravenous (IV) sedation was planned in the outpatient clinic room, and an oral and general preoperative examination was performed for general anesthesia. A total dose of 50 μg of DEX (1.0 μg/kg; total volume, 0.5 mL of a 200 μg/2 mL concentration) was administered intranasally using the MAD Nasal (Teleflex) intranasal mucosal atomization delivery device. However, the sedation level was light (Ramsay Sedation Scale, 2) even after waiting an hour, and it was difficult to lead the patient to the outpatient clinic room. We instead opted to secure an IV line in the corridor with careful restraint and initiated IV sedation, enabling us to proceed with patient care.

On the second occasion, general anesthesia for dental treatment was planned in the operating room of the hospital. We administered 75 μg of DEX (1.5 μg/kg; total volume, 0.75 mL of 200 μg/2 mL concentration) intranasally in the same manner as described previously. An appropriate level of sedation (Ramsay Sedation Scale, 3) was obtained this time after waiting 50 minutes, enabling a smooth entrance into the operating room. Mask induction of general anesthesia with sevoflurane was smoothly performed without any difficulty.

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The planned dental treatment (extraction of a tooth and several resin restorations) was completed without complications, and the total treatment time was 56 minutes. The time from end of anesthesia to extubation was 13 minutes, and the patient exhibited no agitation upon awakening. No adverse events were observed throughout the patient's care.

DISCUSSION

It can be difficult for patients with ID to cooperate with medical procedures such as securing an IV line or accepting a mask during inhalational induction of general anesthesia, even though both examples are considered minorly invasive. As such, the use of a premedication can be quite helpful to facilitate improved patient comfort and compliance. Orally administered premedication involves an extremely low degree of invasiveness, but it does require cooperation from the patient to swallow the medication, which may be difficult for some patients with ID. In contrast, intranasal administration can be performed by a medical practitioner without cooperation from the patient and is simple and safe because it uses an atomizer delivery device to generate a fine misting spray rather than sharp needles.

Intranasal administration of midazolam as a preanesthetic has also been reported, but it can be problematic because midazolam causes irritation and pain in the nasal cavity during administration.[2] On the other hand, intranasal DEX causes no subjective symptoms, such as numbness, irritation, bleeding, or an abnormal taste, nor does it result in local irritation of the nasal mucosa.[3] The optimal dosages for intranasal administration have been reported to be 0.2 to 0.3 mg/kg for midazolam and 1 to 2 μg/kg for DEX.[1] For an adult weighing 50 kg, this dosing would result in 10 to 15 mg of midazolam (2-3 mL if using 5 mg/mL midazolam) and 50 to 100 μg of DEX (0.5-1 mL if using 200 μg/2 mL DEX). Thus, the smaller volume of fluid that needs to be administered is another advantage of using DEX versus midazolam for intranasal premedication.

The present case report suggests that premedication using intranasal DEX may be a useful alternative prior to general anesthesia induction for adult patients with ID. However, previous studies have been limited to healthy pediatric patients, so further studies are needed to determine optimal DEX dosing, the onset and timing of the peak effect, the expected level of sedation, and potential side effects for intranasal DEX used as a premedication for adult patients with ID.

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