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Total Intravenous Anesthesia for Mouth Prophylaxis in Adult Patient With Autistic Disorder: A Case Report

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Abstract

Adult autistic patients schedule for operation need special care such as detailed preanesthetic consultation, specific physical evaluation and careful choice of anesthesia technique. They are very difficult to manage in anesthesia procedure setting because they have very different reactions to any change in routine. They also had pronounced abnormal anatomy possibility than children especially in the face bones that could influence the airway passage.

The aim of this case report is to present total intravenous anesthesia (TIVA) as a choice of anesthesia techniques which is best suited for the adult autistic patient. This technique uses intravenous anesthesia drugs, propofol and fentanyl, for anesthesia induction and maintenance and avoid the use of anesthesia gasses. The rarity of this technique used in autistic patient lead to a very limited literature in anesthesia technique in adult autism patient.

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Introduction

Autism is an heterogeneous developmental disorder specifically characterized by social communication or interaction impairment and behavioral oddities, included in autism spectrum disorder (ASD). There is a very diverse variation in the severity of autism often accompanied by other organ abnormality and physical malformations. Adult autism patient has few different things than children, they have adult physic strength, developed behavior routine and more pronounced anatomy abnormality especially in the face that could interfere the airway passage.^{i,ii}

Adult autistic patient often schedule for operation with general anesthesia because of tooth problems including poor oral hygiene, abnormal structure and anatomy of tooth and jaw.

Detailed preanesthetic consultation, specific physical evaluation and careful choice of anesthesia technique are very important in such patient. The literature in TIVA technique in adult autism patient still very limited.ⁱⁱⁱ

This patient is a very rare case of adult autistic patient who underwent mouth prophylaxis (teeth restoration, extraction and scaling) with TIVA. This case provides information of TIVA effect to adult autistic patient, including premedication, during operation and recovery process.

Case Report

A 21-year-old female, 45 kg, 170 cm, classified as American Society of Anesthesiologists physical status III with severe autism, moderate mental retardation, language disability-stage 5, BMI 15.57, mild micrognathia and mallampati score 2. He also has abundant saliva production. Preoperative tests were slight abnormal for electrolite, sodium 130 and hepatic function, SGOT 30, SGPT 35. Patient was scheduled

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for mouth prophylaxis under general anesthesia (Figure 1).



Figure 1. Patients before the operation & after the nasal intubation. He wore eyes pads.

Ketamin 1 mg/kgBW and atrophine sulfate 0.5 mg/kgBW intramuscular were used as premedication. Standard monitoring, including electrocardiogram (EKG) and pulse oxymetry were applied in the operation room. Preoperative vital signs were blood pressure of 100/65 mmHg, a heart rate of 95 beats/min, oxygen saturation rate of 98% and sinus rhythm at EKG.

After an intravenous access was established, the patient's fluid level was maintained with normal solution as crystalloid solution. Anesthesia was induced with propofol 2 mg/kgBW and fentanyl 1 ug/kgBW. Atracurium 0.5 mg/kgBW was used to facilitate intubation. He was nasal intubated with non kinking endotracheal tube with an internal diameter 6.0 mm under direct laryngoscopy. Intubation proces encountered no problems. The patient was mechanically ventilated with pressure control mode. Anesthesia was maintained with continuous infusion of propofol 150-200 ug/kg/min using an Infusomat® Space BBraun, oxygen 3L/min and medical air 2L/min. Propofol infusion was adjusted to keep PRST score at 1-3. Hemodynamic values and oxygen saturation were recorded at 5 min intervals

intraoperatively. Vital signs were stable throughout the procedure. Total procedure was 120 min. After operation finished, propofol infusion was stopped and extubation was done after the PRST score reached 5. The time from stoppage of propofol infusions until extubation was 10 min.

The patient was transferred to the recovery room and discharged from the hospital on the same day. There are no regression signs found within a few days after anesthesia procedure.

Discussion

Autism has a very wide variation in severity of illness and behavioral pattern. Mental retardation occurred approximately 70% of individuals with autism.^{iv} Adult autism patient has it's own characteristic, including stronger physical strength, developed repetitive behavior and more prominent anatomy problem possibility caused by abnormal face or jaw bones structure that could interfere the airway passage and make more risky intubation procedure.^v

Premedication is a must in such patients because operative setting and anesthesia procedure are traumatic experience and to facilitate intravenous line installation.

Ketamine was used as premedication because it has no depressive effect to cardiac and respiratory effect apart besides ketamine is the drug of choice for intermediate to severe mental retarded patient.^{vi} The hallucinogenic effect of ketamine could be eliminated with a sufficient dose of midazolam. Atrophine sulfate was used to reduce saliva production.^{vii}

Anesthesia induction was performed with propofol and fentanyl. Our patients seem have a higher need for propofol quantity during induction compare to normal person.^{viii} Regardless of opinion differences on propofol effect in autistic patient, propofol as an intravenous agent has no accumulation effect, provides early recovery and faster discharge.

Propofol also has anti stress response and antioxidant effect, these characteristics may give a positive value to lower high cortisol and free radical level often found in autistic patient.^{ix} Some anesthetic gasses were avoided because of a higher risk of malignant hyperthermia in mental disorder patients related to the possibility of mitochondrial disorder.

Nitrous oxide depletes the folate system and deactivate methionine synthase which is a B12-dependent enzyme important in methylation cycle. Halothane is a highly fat-soluble drug that is difficult for the liver to metabolize and should be avoided in patient with impaired liver function. Administering those gasses simultaneously might result in learning disabilities or play a role in triggering or manifestations of ASD.^{x,xi}

Conclusion

Total intravenous anesthesia in adult autistic patient provides some advantages including hemodynamic stability, early smooth recovery and faster discharge. This technique also avoid the uses of some anesthetic gasses which have adverse effects including malignant hyperthermia, hepatic disorder and learning disabilities possibilities, thus increasing the patient safety.

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Declaration of Interest

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