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Dexmedetomidine as a total intravenous anesthetic in infants

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Introduction: Dexmedetomidine is a highly selective α2 adrenoceptor agonist that has been used increasingly in children (1-3). In contrast to many anesthetic agents, dexmedetomidine preserves the spontaneous ventilation which makes it a very useful adjuvant to other anesthetics (4). It could be more valuable in procedures that require spontaneous ventilation such as upper airway surgeries. In this case report, we describe using dexmedetomidine as the primary anesthetic in four infants who underwent direct laryngoscopies and bronchoscopies where spontaneous ventilation was required. Dexmedetomidine was titrated to achieve the clinical effects that allowed performing the procedures.

Methods: Four infants, ages 2 weeks through 11 months, required direct laryngoscopies and bronchoscopies under GA for different reasons. ASA monitors where applied and GA was induced with IV dexmedetomidine in increments of 1 mcg/kg every minute. The otolaryngologist then introduced the laryngoscope, exposed the larynx and sprayed 1% lidocaine on the vocal cords. Additional doses of dexmedetomidine were administered as necessary. One dose of propofol was administered to one patient secondary to head movement. The patients were spontaneously breathing all the time and O2 was provided through a nasal canula.

Results: The patients were hemodynamically stable throughout the procedures, and the surgeon was satisfied with the examination as there was no interruption to his work.

	Age	Procedure	Duration (min)	Total dose of dexmedetomidine (mcg/kg)	Propofol needed (mg/kg)	Time in PACU (min)	Vital signs	SPO2	Surgeon's Satisfaction
Case one	3 m/o	Direct Laryngoscopy and bronchoscopy	14	2.85	No	NICU	Within 20%	100	Not evaluated
Case two	2 w/o	Direct Laryngoscopy and bronchoscopy	11	4.4	3.7	49	Within 35%	100	Satisfied
Case three	11 m/o	Direct Laryngoscopy and bronchoscopy	7	2	No	38	Within35%	100	Very satisfied
Case four	3 ½ m/o	Direct Laryngoscopy and bronchoscopy	38	4.6	No	NICU	Within 20%	100	Very satisfied

Discussion: This case report demonstrates that dexmedetomidine can be used in pediatric patients as the primary anesthetic agent for upper airway surgeries that require spontaneous ventilation. Ramsay and Luterman have reported using dexmedetomidine as the only anesthetic for three adults requiring upper airway surgeries (5). They described infusing dexmedetomidine in unconventional doses (5-10 mcg/kg/min) to achieve an effect that will allow proceeding with the procedure. We titrated dexmedetomidine by administering 1 mcg/kg every minute as a bolus dose to achieve "surgical fit" conditions. High doses of dexmedetomidine have been shown to cause peripheral vasoconstriction in adults which leads to increased systolic blood pressure (6,7). We have noticed a 20-30% increase in blood pressure in our 4 patients. However, the heart rate decreased in all of them by the same range. As for the respiratory effects of these high doses, all patients remained spontaneously breathing and maintaining an SPO2 of 100, and airway support maneuvers were not needed in any of them. However, as we did not have invasive monitoring in any of our patients we do not know the status of PaCO2. Clinically, the patients were adequately breathing and we do not have any suspicion that they did not maintain a baseline PaCO2.

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