

Dexmedetomidine: The game changer or a team player?

They say “Be a game changer, the world has enough followers.” A few decades back, an alpha agonist named dexmedetomidine (DEX) was introduced, and the US Food and Drug Administration gave its approval as sedative for mechanically ventilated adults in intensive care units in 1999. In 2008, the approval was extended for procedures outside the operating room in nonintubated adults. This was soon followed by a plethora of off-label uses.^[1,2] An editorial published in this journal about 5 years back, exhaustively reviewed the emerging role of DEX.^[3]

In the initial years of clinical use, there were apprehensions regarding the hypotension and bradycardia (hypertension initially or with use of larger doses). Over the years, it was realized that most side effects are dose-dependent and occur in volume-depleted patients. As further studies poured in and the literature built up its strength, so did the confidence of the users. The time has come where DEX has become an essential, if not an inescapable part of routine anesthesia drug trolley. DEX is conventionally administered as an infusion, but reports of its safe and convenient use as rapid boluses have also started being published.^[4] This would make its use less cumbersome in routine practice.

In recent years, the drug has been either used as part of premedication in oral/nasal/buccal/nebulized/intravenous form or as an adjunct to induction to attenuate the stress of laryngoscopy and intubation.^[5] It has also been an adjunct for maintenance of anesthesia and part of the reversal process (to facilitate smooth extubation and reduce emergence agitation).^[6-8] Several researchers have used DEX for inducing controlled hypotension during ENT surgeries.^[9,10] The anti-shivering and antisialagogue properties of the drug in the perioperative period have also been studied. DEX has been effectively used in difficult airway during awake fiberoptic intubation, especially in patients who pose a life-

threatening risk of intubation under general anesthesia.^[11] There are several reports of its use in awake craniotomy, spine surgeries, and deep brain stimulator placement, in adults and children.^[12-14]

As an adjuvant, DEX is known to improve the quality and duration of spinal, epidural, and caudal anesthesia.^[15] Likewise, the drug has shown improved block characteristics, sedation, and hemodynamic stability in several peripheral nerve blocks.^[16] Today, based on the animal studies, DEX has been found to be neuroprotective and, therefore, can be probably given to the children safely.^[17]

On the other hand, in spite of its multifarious usability as when used alone DEX can neither be a sole induction agent nor it can maintain the depth of anesthesia or achieve regional anesthesia alone. The dosages required for procedural sedation at deeper levels may hamper hemodynamic stability.^[18] It has most of the properties of an ideal anesthetic agent, but its sole use is inadequate for most indications. DEX at best is not a game changer; it is a team player, a good adjuvant that we need at almost every step in the field of anesthesia and critical care. It is a very useful drug, but its sole use for any indication should be discouraged. It is a drug you could do without, and yet it is a drug you could do better with.

A different avatar of DEX, as a combination with ketamine, has appealed to me for very long. Its usability for procedural sedation has been explored in a large number of clinical scenarios such as gastrointestinal endoscopic procedures, cardiac catheterization, burns dressing, awake fiberoptic intubation, extracorporeal shockwave lithotripsy, muscle biopsy, and cataract surgery.^[19,21]

Some of the favorable properties of these two drugs are complementary, whereas some side effects counterbalance each other. The effect of sedation and analgesia is additive in its time of onset and quality. Both the drugs preserve spontaneous breathing as well as the airway reflexes in routine doses. On the other hand, the cardiovascular stimulatory effects of ketamine balance the hypotension and bradycardia that

Access this article online	
Quick Response Code:	Website: www.joacp.org
	DOI: 10.4103/0970-9185.182084

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How to cite this article: Goyal R. Dexmedetomidine: The game changer or a team player?. *J Anaesthesiol Clin Pharmacol* 2016;32:144-5.

may occur because of DEX. DEX also helps in attenuating ketamine-induced salivation and emergence complications. The recovery profile of this drug combination following procedural sedation is good. Further studies would determine whether this combination could be safely used for daycare procedures.

This issue of the journal deals with some of the studies and reports on the use of DEX in its diverse role as an adjuvant in our routine anesthesia practice. One study shows the effect of DEX premedication in lowering intraocular pressure and the pressor response to laryngoscopy and intubation. In another study, the authors have compared DEX with nitroglycerine and esmolol for induced hypotension during functional endoscopic sinus surgery. They have showed that DEX group had better hemodynamic stability, operative field visibility, reduced analgesic requirements, and prolonged postoperative sedation. Intravenous DEX was also compared with propofol for sedation during a subarachnoid block, showing early onset and recovery with propofol but better patient satisfaction and prolonged analgesia in the DEX group. DEX was compared with clonidine and tramadol for postoperative shivering. Two studies have used DEX as an adjuvant to bupivacaine, one in intrathecal and the other in epidural space, and found good results.

We hope these studies would give further insight into the subject and impart deeper understanding to the art of using DEX in the most beneficial way.

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