

Dexmedetomidine vs Fentanyl in Attenuating the Sympathetic Surge During Endotracheal Intubation: A Scoping Review

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Purpose

- To provide an overview and comparison of the literature on two pharmacologic interventions intended to attenuate the sympathetic response to endotracheal intubation.
- **Specific Aims**
 - 1. Explore existing literature on two pharmacological interventions intended to attenuate the sympathetic surge response to endotracheal intubation
 - 2. Identification of gaps in the current literature that could guide future research in this field
 - 3. To propose dexmedetomidine as an opioid-sparing intervention to attenuate the sympathetic surge response to endotracheal intubation

Background

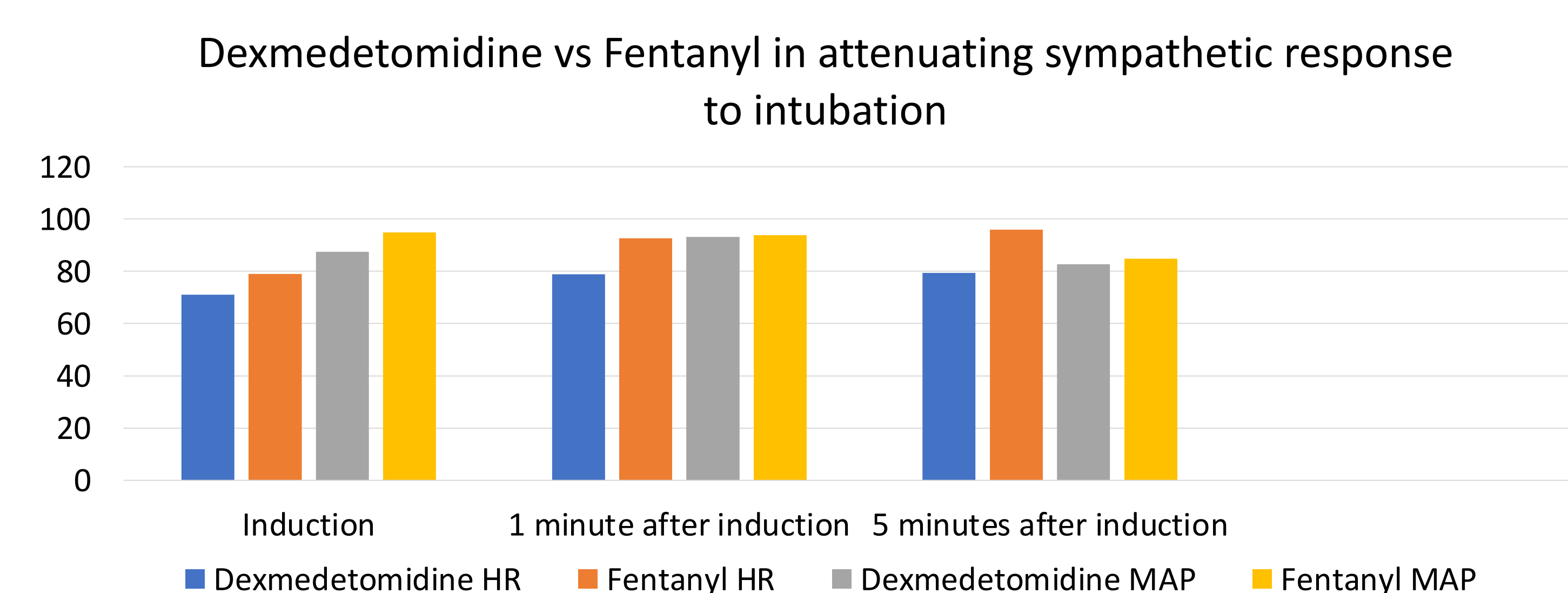
- **Opioid epidemic in the United States**
 - Anesthesia providers are opting for opioid sparing and opioid free practices
- **Direct laryngoscopy and endotracheal intubation**
 - Associated with hemodynamic changes due to reflex sympathetic discharge of catecholamines caused by airway stimulation
 - → may result in hypertension, tachycardia, and arrhythmias
- **Pharmacologic interventions to attenuate the sympathetic response to endotracheal intubation**
 - Fentanyl is commonly administered
 - A potent opioid that has a rapid onset and short duration of action
 - Dexmedetomidine is becoming more readily available
 - Non-opioid, alpha-2 adrenergic agonist that decreases the release of norepinephrine, has analgesic properties, and lowers the heart rate
- **There is a need for evidence proving the effectiveness of dexmedetomidine**

Methods

- **Study Design**
 - Scoping Review of retrospective and prospective studies
- **Types of Studies**
 - Full-text, peer-reviewed, English, no limit on country of study, between the years of 2009 and 2021
 - Non-randomized, randomized control, clinical trial, and quality improvement
- **Databases**
 - PubMed, CINAHL, Google Scholar, and Cochrane Library
- **Study Duration**
 - August 2019-May 2021
- **Study Population**
 - Adult surgical patients between ages 18 and 75 undergoing elective general anesthesia induction and endotracheal intubation
- **Data Abstracted**
 - Hemodynamic variables: systolic blood pressure, diastolic blood pressure, mean arterial pressure, and heart rate

Results

- **Dexmedetomidine was shown to more effectively prevent a rise in heart rate and blood pressure in 6 RCT's compared to fentanyl.**
- **In 1 RCT, the hemodynamic parameters were comparable in both the groups except at 1 min postintubation when fentanyl group had a significantly higher HR.**



Implications for Practice

- **Dexmedetomidine is a safe and effective contender that could replace the role of fentanyl during endotracheal intubation**
- **Limited findings during the scoping review suggest that there is a lack of research aimed at the elimination of opioids, namely fentanyl, during the induction of general anesthesia**
- **Future research should be conducted with increased sample sizes and should measure hemodynamic variable (HR, SBP, DBP, MAP, SpO2, etc.) stability and changes.**

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