IN BRIEF  A Summary of the Evidence

Dexmedetomidine for Sedation in the Critical Care Setting

Key Messages

- The use of dexmedetomidine in the intensive care unit (ICU) may improve rates of delirium compared with midazolam and propofol; however, it may increase rates of bradycardia (abnormally slow heart rate) compared with traditional sedatives (midazolam, lorazepam, and propofol).

- The use of dexmedetomidine may also decrease time spent on mechanical ventilation compared with midazolam. It may also decrease time to extubation (endotracheal tube removal) compared with midazolam and propofol.

- Dexmedetomidine may be cost-saving compared to traditional sedatives; however, this is based on assumptions around ICU, nursing, and mechanical ventilation costs, and the length of an episode of delirium.

Issue

Dexmedetomidine at its maximum daily dose is more costly than traditional sedatives. However, there might be cost-savings if the cost is offset by additional benefits, like decreased incidences of agitation and delirium. An economic assessment, supported by a review of the clinical literature, will aid in decision-making about which drugs to use for the sedation of patients in a Canadian ICU setting to facilitate mechanical ventilation.

Methods

An economic assessment was performed to determine the comparative cost-effectiveness of dexmedetomidine compared with propofol, lorazepam, and midazolam for the sedation of patients in the ICU to aid mechanical ventilation. To explore this question, a limited economic and clinical literature search was conducted of key resources, and titles and abstracts of the retrieved publications were reviewed. Full-text publications were evaluated for final article selection according to predetermined selection criteria (e.g., population, intervention, comparator, outcomes, and study designs).

Results

For the economic review, the literature search from a 2014 CADTH review was updated, and 294 potential studies were found. Two studies met the criteria for inclusion, and three additional studies were identified. However, these were not applicable to the Canadian context and it was necessary to conduct a new cost analysis, with input from the clinical review and a clinical expert. In the economic model, the main driver of the results was the cost of an ICU stay, which was not statistically significant between treatments in all included studies. Dexmedetomidine is associated with higher drug costs compared with midazolam, lorazepam, and propofol, but may result in reduced costs associated with the length of an ICU stay and the cost of delirium. However, these findings varied based on the comparator, which population was assessed, and the underlying assumptions.

In the clinical review, 657 potential studies were identified in the literature search. After screening and full-text review, 19 articles reporting on 19 randomized controlled trials were included in
the report. The clinical data differed between studies (i.e., was heterogeneous) and may not be generalizable to the Canadian setting. Input from a clinical expert was used to determine which studies were most relevant to the research question. The use of dexmedetomidine in the ICU may result in:

- a decreased incidence of delirium compared with midazolam and propofol
- an increased incidence of bradycardia (abnormally slow heart rate) compared with midazolam, lorazepam, and propofol
- a decreased time to extubation (endotracheal tube removal) compared with midazolam and propofol
- a decreased duration of mechanical ventilation (assisted breathing) compared with midazolam.

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