

Effectiveness of Dexmedetomidine as a Primary Sedative During MAC Anesthesia

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Introduction

Primary Objectives of My Integrated Research Review

- Assess dexmedetomidine utilization as primary anesthetic
- Identify and evaluate research needs
- Ascertain provider guideline needs for procedures
- Focus on improving patient outcomes.

Dexmedetomidine may have beneficial use as an ideal primary anesthetic with minimized respiratory depression concerns procedures requiring monitored anesthesia care.

Analyses

The IRR investigator evaluated each selected article for appropriateness and collected data related to the rationale and objective.

Granular data was arranged according to the type of anesthetic care, elective or non-elective surgery, outcome measurement (vital signs or post-operative report).

Additional data was extracted to track potential bias, study type, design, purpose, and ultimate findings.

Compiling all of these data points allowed for fair evaluation of each article, analysis for the purpose and objectives of this IRR, along with a recommendation concerning the feasibility of dexmedetomidine use as a sedative in MAC procedure settings.

Additional Focus

Three additional data points were part of this IRR:

- Ease of wakefulness after cessation of sedation
- Reduction in anxiety for procedural sedation
- Minimized procedural recall

These data points were observed in varying clinical settings.

Key Findings

Dexmedetomidine has potential that should be explored

- Dexmedetomidine has demonstrated efficacy for specifically identified procedures
- Results vary from procedure to procedure.
- Use of dexmedetomidine is currently cost prohibitive
- Additional research concerning specific procedure benefits may increase interest
- Increased interest may reduce comparative cost differences enough to justify use recommendations

Results

This review included summary journal articles, observational clinical studies, systematic reviews, randomized controlled studies, and prospective randomized studies.

Appropriate studies were selected by screening results from the database searches to ensure that the search terms existed in the abstract and/or title of all the articles reviewed.

165 articles were searched, screened, and evaluated for inclusion in this IRR when appropriate.

Ultimately, 10 articles were included in this review. Specifically, focusing on the use of dexmedetomidine as a primary MAC anesthetic.

Research results were organized according to three primary factors:

- Efficacy as a primary anesthetic,
- Kinetic properties of drug as primary anesthetic,
- Cost effectiveness.

Measurement of those factors in monitored anesthesia care can occur in regional or general anesthetic settings—in various inpatient and outpatient surgical procedures.

Data points indicative of those factors was analyzed to determine if dexmedetomidine is appropriate for use as the sedative in monitored anesthesia care.

Specific Findings Indicate Dexmedetomidine:

- Reduces mean arterial pressure and heart rate within acceptable ranges
- Reduces incidences of pulmonary hypertensive crisis
- Provides excellent sedative and analgesic properties without inducing respiratory depression.
- Produces superior respiratory stability while reducing opioid consumption, compared to propofol
- May reduce required levels of supplementary drugs that induce respiratory depression, but is not capable as a sole agent for painful procedures
- May have diskography procedure use for adolescent patients
- May be used as the sole agent for patients undergoing the liberation procedure.

Implementation

A PowerPoint presentation was presented to the class of 2022. Before the presentation, the participants were asked to complete a pre-presentation survey to assess their comprehension of dexmedetomidine's sedation capabilities as an alternative to traditional sedatives employed in monitored anesthesia settings. After the presentation, participants were asked to complete a post-presentation survey that contained questions assessing the presentation quality, in terms of content usefulness, content delivery and comprehension of use of dexmedetomidine as the primary anesthetic during monitored anesthesia care. A total of fourteen students responded to the surveys from November 15, 2020 to December 1, 2020. Overall, every student agreed that the presentation increased their knowledge and comprehension concerning the use of dexmedetomidine as the primary anesthetic during monitored anesthesia care.

Methods

Reviewed articles were included or excluded according to predetermined inclusion parameters, including:

- Populations comprised of individuals from both healthy and high-risk populations
- Populations who receive monitored anesthesia care during a surgical procedure.
- Populations where monitored anesthesia care was utilized in both regional and general settings,
- Populations undergoing procedures involving opioids, propofol, and benzodiazepines.
- Populations where outcome factors evaluated efficacy in terms of sedation, incidents of respiratory depression.
- Population studies referencing cost, provider knowledge, pharmacodynamics and kinetic properties as additional inclusion factors.
- Population studies published no earlier than ten years before this IRR (2010 – 2020).

Conclusions

This IRR demonstrates that dexmedetomidine meets clinical standards for sedation in varied MAC settings.

These settings apply to elective and non-elective procedures that may include both general and regional anesthesia.

- Clinical use of dexmedetomidine as the primary anesthetic allows sedation without the risk of dependency-induced respiratory depression.
- may be useful as an adjunctive agent alongside another sedation agent, as a primary agent when spontaneous breathing is essential, or when the ability to spontaneously arouse the patient from their sedative state is desired.
- Both low and high-risk patients may benefit from the delivery of dexmedetomidine as a MAC sedative that minimizes adverse reactions and respiratory distress experienced when using propofol, opioids, or benzodiazepines during procedures.
- More narrowly tailored research is necessary to identify any efficacy advantages that would justify the cost of dexmedetomidine or increase interest and usage to levels that may bring costs closer to current MAC anesthetics.

References and Acknowledgments

References Link

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