Cost-effectiveness analysis of dexmedetomidine versus propofol for sedation in mechanically ventilated patients after cardiovascular surgery: an institutional perspective (Poster #18)

Matthew Wanat, PharmD, BCPS; Kalliopi Fitousis, PharmD, BCPS; Fariedeh Boston, PharmD; Faisal Masud, MD, FCCP

The Methodist Hospital, Houston, Texas

INTRODUCTION

Sedation is a key component in mechanically ventilated patients to achieve patient comfort and maximize ventilator synchrony. Many pharmacologic agents are available for sedation post-operatively. Dexmedetomidine (Precedex®) and propofol (Diprivan®) are two of the most commonly used sedative agents in mechanically ventilated patients requiring sedation for a short predicted duration[1]. These agents have distinctly different mechanisms of action and pharmacokinetic profiles, making them attractive options for sedation after cardiovascular surgery. However, therapy with dexmedetomidine is significantly more expensive compared to propofol. Due to the high volume of cardiovascular surgeries performed at The Methodist Hospital and the increase in use of dexmedetomidine since 2007, we conducted a study to compare the cost effectiveness of both medications for sedation after cardiovascular surgery.

OBJECTIVE

The objective of this pharmacoeconomic analysis was to determine which medication, either dexmedetomidine or propofol, is the more cost-effective agent for sedation after cardiovascular surgery based on efficacy, measured by time on mechanical ventilation and requirement of second sedative agent, and safety, measured by incidence of delirium and mortality.

METHODS

Perspective	Institutional
Options	Dexmedetomidine continuous infusion vs. propofol continuous infusion, titrated to a RASS goal per physician orders
Population	Patients 18 years + who underwent either CABG and/or valve surgery
Timeframe	January – June 2011
Primary Outcome	Time on mechanical ventilation after cardiovascular surgery
Type of Study	Cost-effective analysis

All efficacy and safety data was derived from a previous retrospective investigation comparing both of these agents

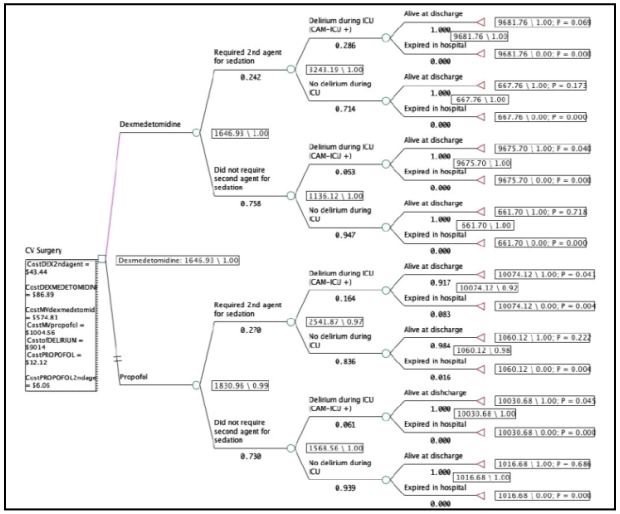
COSTS

Variable	Cost (USD)
Acquisition cost of dexmedetomidine (average/hrs on sedation)	87
Acquisition cost of propofol (average/hrs on sedation)	12
Acquisition cost associated with addition of second agent for sedation (patients originally on dexmedetomidine)	6
Acquisition cost associated with addition of second agent for sedation (patients originally on propofol)	43
Cost associated with mechanical ventilation (hourly)[2]	78
Cost associated with incidence of delirium[3]	9014

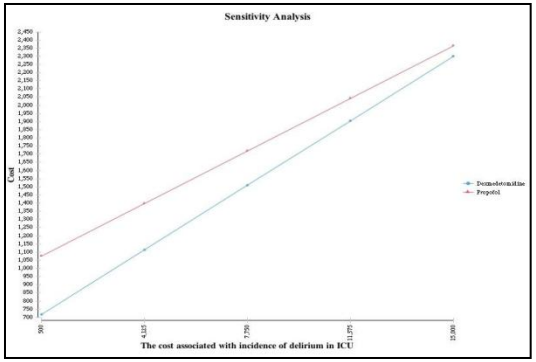
Drug acquisition costs based on institutional costs

RESULTS

Primary Sedative Agent	Average Cost of Sedation per Patient (USD)
Dexmedetomidine	1647
Propofol	1831



SENSITIVITY ANALYSIS



LIMITATIONS

- Retrospective analysis - chart review with no active intervention
- Study did not look at the effect concomitant medications, such as opioids or antipsychotics may have had on sedation or cost

CONCLUSION

Dexmedetomidine was the more cost-effective option for sedation in this post operative cardiovascular surgery population. Sensitivity analysis were performed varying the cost associated with delirium and the cost associated with the medications, and dexmedetomidine was still the preferred option.

REFERENCES

1. Jacobi J, Fraser GL, Coursin DB, et al. Clinical practice guidelines for the sustained use of sedatives and analgesics in the critically ill adult. *Crit Care Med* 2002;30:119-141.

2. Dasta JF, McLaughlin TP, Mody SH, Tak Piech C. Daily cost of an intensive care unit say: The contribution of mechanical ventilation. *Crit Care Med*2005;33(6):1266-1271.

3. Milbrandt EB, Deppen S, Harrison PL, et al. Costs associated with delirium in mechanically ventilated patients. *Crit Care Med* 2004;32(4):955-962.

DISCLOSURES

All authors of this research project have nothing to disclose regarding financial or personal relationships that may have a direct or indirect effect on the study.