

EVALUATION OF BISPECTRAL INDEX MONITORING IN GENERAL ANESTHESIA THROUGH A HEALTH TECHNOLOGY ASSESSMENT METHOD: A POTENTIAL INTRODUCTION IN CLINICAL PRACTICE IN AN ITALIAN HOSPITAL?

E. Guido¹, M.E. Borghesi², A. Saccardi²

¹University of Milan, Specialization School in Hospital Pharmacy, Milan, Italy

²ASST Carlo Poma - Mantova, Hospital Pharmacy, Mantova, Italy



Background and Importance

The use of Bispectral - Index (BIS) as standard practice might be useful for anesthesia management by reducing the risk of intraoperative awareness (0.1-0.2% of surgical population), consumption of anesthetic agents, recovery time and total cost of anesthesia.

Aim and Objectives

The objective of this systematic review is to assess the efficacy of BIS-guided anesthesia monitoring for its potential introduction as standard practice in an Italian hospital.

Materials and Methods

The study was conducted from January 2008 to July 2019, using the following databases: PubMed, Cochrane Library, ECRI and NICE. The articles included meta-analysis, randomized control trials, Health Technology Assessment reports and guidelines of BIS-guided monitoring versus clinical signs as standard practice during general anesthesia in adult patients. The evaluation was conducted according to the scheme reported in the sub annex G of Lombardy's Resolution XI/1046 which describes methods for the systematic research and critical analysis of the literature sources and the drawing up of an Health Technology Assessment (HTA) Report.

Results

We reviewed 18 articles to analyze the benefits in terms of more reliable statistical evidence and cost-effectiveness studies. BIS was able to reduce the risk of intraoperative awareness in high-risk patients by 80% (OR=0.24 95% CI 0.12,0.48).

Furthermore it has shown to reduce discharge time from postanesthesia care units by about 23 mins (95% CI -31.01,-13.69; I²=20%), post-operative nausea and vomiting by 12%, risk of post-operative cognitive disorders at 3 months after extubation by 3% (95% CI -0.05,-0.00; I²=52%) and risk of post-operative delirium by 6% (95% CI -0.10,-0.03; I²=11%).

Conclusion and Relevance

BIS-guided monitoring reduces the risk of intraoperative awareness in high-risk patients under intravenous general anesthesia. Furthermore it proved to be effective in reducing consumption of anesthetic agents, time to discharge from postanesthesia care units and post-operative adverse events.

However the international guidelines suggest evaluation of clinical signs as standard practice to guide the dosages of anesthetic agents and recommend as an option the use of BIS-monitoring.

It remains to be clarified whether BIS technology is cost-effective, considering the low prevalence of intraoperative awareness and whether it represents a real benefit in peri and post-operative preventable adverse events. The costs of preventable adverse events should be evaluated at a single healthcare facility level, considering long-term benefits.

References and/or acknowledgements

1. <https://www.ncbi.nlm.nih.gov/pubmed/24937564>
2. <https://www.ncbi.nlm.nih.gov/pubmed/23962378>

