

# Blocking noise but not music lowers bispectral index scores during sedation in noisy operating rooms

Stefania MAGDA, MD

Cardiology and Internal Medicine Department, Emergency University Hospital, Bucharest, Romania

## BACKGROUND

Previous studies suggest that listening to music during surgery can reduce the need for intraoperative sedatives. On the other hand some authors have theorized that the effects of music might be due only to elimination of ambient operating room (OR) noise.

A bispectral index (BIS) monitor continually analyses a patient's electroencephalogram during anaesthesia to assess the level of consciousness.

## OBJECTIVE

Randomized, controlled trial for determining if music or blocking noise could reduce BIS scores during propofol sedation in patients undergoing total knee replacement surgery for degenerative arthritis.

## METHODS

A preliminary study was performed to check the ambient noise level with a sound level meter. To prepare the music, 40 patients proposed for total knee replacement surgery for a list of their favorite music. 3 CDs were

prepared, categorized into folk, popular or classical music.

The sedation study enrolled 63 patients aged 55-78 years scheduled to undergo total knee replacement surgery. Preoperative hearing acuity was checked, and patients with poor auditory function, as well as patients with poor renal function, poor liver function, or cardiopulmonary disease were excluded from the study.

Patients were randomized to three groups (noisy, n = 21; silence, n = 21; and music, n = 21). After the spinal anesthesia, sedation was begun with propofol with a target blood concentration of 1.2 µg/mL. Immediately after beginning the propofol infusion, a headset was applied to patients in the silence or music group. In the silence group, patients' ears were packed tightly with cotton wool to block the ambient noise, and the headset was applied. The noise group patients were exposed to the ambient OR noise. The BIS measurement was begun before administering the propofol and was recorded 7 times throughout the surgical procedure. Hemodynamic status was recorded at the same time as the BIS score.

After patients had been transferred to the postanesthesia care unit, their ability to

remember their dreams and sounds, as well as their mood and pain was assessed.

## RESULTS

Age, gender, level of sensory block, and operation time were similar in the three groups. Bispectral index scores in the silence group when the saw and impact device were used was significantly lower than in the noise group ( $P = 0.025$  and  $0.005$ ). Preoperative level of anxiety, postoperative level of comfort and scores for postoperative pain were similar in all subgroups, with no correlation among them. No significant alterations of the blood pressure or the oxygen saturation were noted in the 3 subgroups during intervention.

## CONCLUSION

The present study shows that listening to music during propofol sedation does not affect BIS scores in elderly patients undergoing total knee replacement surgery during combined spinal-epidural anesthesia, although blocking all noise does so. Limitations:

1. the method used to choose the music, with only three CDs prepared;
2. plasma propofol concentrations were not measured;
3. BIS scores were recorded during a fixed target concentration, which can cause oversedation or awakening (changing the target concentration of propofol maintains a steady sedation level).



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### *Comment on the paper:*

**Kang JG, Lee JJ, Kim DM, et al** – Blocking noise but not music lowers bispectral index scores during sedation in noisy operating rooms. *Journal of Clinical Anesthesia* 2008; 20:12-16