Clinical Impact of Continuous Dexmedetomidine Based Sedation in CABG Surgery Patients

Seok Hoon Kim, **Sangseok Lee**, Byunghoon Yoo, Kye-Min Kim, Jun Heum Yon

Dept. of Anesthesiology and Pain Medicine, Sanggye Paik Hospital, Inje University, Seoul, South Korea

Background and Goal of Study: This prospective, randomized, open-label, controlled study was designed to compare dexmedetomidine-based to midazolam-based sedation after coronary artery bypass graft (CABG) surgery in the cardiac intensive care unit.

- Previous standard protocol in my institute for sedating the CABG patients in the ICU postoperatively: intermittently bolus injection of midazolam with/without fentanyl
- **Difficulty to control the sedation level as much as a cardiac surgeon wants → It causes poor satisfaction of both patients and doctors.**

Materials and Methods: After approval of IRB and written informed consent, forty patients scheduled for elective CABG surgery were computerized randomly assigned to each group.

- **Midazolam** (Midazolam inj.®, Bukwang pharm., Seoul, Korea) group : **0.03-0.1 mg/kg i.v. bolus intermittently**
- **Dexmedetomidine** (Precedex® inj., Hospira, IL, USA) group : **0.7 µg/kg/hr. i.v. continuously**
- Exclusion criteria: ASA PS class V, emergency operation, chronic sedative or hypnotic drug users, patient who have severe valve dysfunction also.
- **The study drug was administered from the time of sternal closure until weaning from mechanical ventilator.**
- **An infusion rate of dexmedetomidine or additional dose of midazolam was determined based on maintaining a RASS (Richmond Agitation-Sedation Score, +4=combative, 0=alert & calm, -5=unarousable) more than -3 (moderate sedation, any movement (but no eye contact) to voice).**
- We recorded **sedation score, time to extubation, ICU stay time, hemodynamics with cardiac index and pulmonary artery pressure, VAS for pain** (0=no pain, 5=moderate pain, 10=unbearable pain) and various side effect every 2 hours.

Results and Discussion:

- The patient treated with dexmedetomidine showed significantly lower level of sedation than midazolam (P=0.008, Figure F).
- Average times to spontaneous respiration (865±181 min vs 884±272 min, P=0.862), to weaning from mechanical ventilator (1,020±95 vs 973±276 min, P=0.642), and to ICU staying (75±8 vs 69±8 hour, P=0.177) were similar between midazolam and dexmedetomidine group, respectively (Table 1).
- The hemodynamic variables (MAP, HR, cardiac index, pulmonary artery pressure and etc., Figure A to E) and incidence of side-effects (delirium, shivering, nausea, vomiting, and pain, data were not shown) did not differ between the groups.

Table 1. Characteristics of Each Group

	Midazolam	Dexmedetomidine	P-value
Time to PSV mode (min)	865±181	884±272	0.862
Weaning from MV (min)	1,020±95	973±276	0.642
ICU stay duration (hr)	74.7±8	69.3±8	0.177
Day of discharge (day)	15.2±5.3	12.3±1.6	0.137
Postop. bleeding (ml)	497.8±442.9	608.9±435.9	0.599

Conclusions: Sedation with dexmedetomidine 0.7 µg/ kg/hr i.v. provide effective sedation for post-CABG surgical patients, in particular, who need a deeper level of sedation. Nevertheless, patients who received sedation with dexmedetomidine did not show delayed recovery and any other side effects.

References: 1. Ji F, Li Z, Young N, Moore P, Liu H. Perioperative dexmedetomidine improves mortality in patients undergoing coronary artery bypass surgery. J Cardiothorac Vasc Anesth 2014; 28:267-73.
2. Herr DL, Sum-Ping ST, England M. ICU sedation after coronary artery bypass graft surgery: dexmedetomidine-based versus propofol-based sedation regimens. J Cardiothorac Vasc Anesth 2003;17:576-84.