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Dexmedetomidine versus Propofol Sedation Reduces Delirium after Cardiac Surgery; A Cross Sectional Study

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ABSTRACT

Introduction: Postoperative delirium (POD) represents a notable complication subsequent to heart surgery. The use of dexmedetomidine for delirium prophylaxis is still debated. The authors hypothesised that dexmedetomidine sedation after cardiac surgery would reduce the incidence of postoperative delirium (POD). **Materials and Methods:** This study included heart surgery patients aged ≥60, excluding those with dementia, delirium, or major depression. ICU patients received four hours of propofol or dexmedetomidine (initial dose 0.4 µg/kg, then 0.2–0.7 µg/kg/h infusion). Delirium was assessed every 12 hours for five days, with POD frequency as the primary outcome. **Results:** This study compared dexmedetomidine and propofol for sedation in cardiac surgery patients. The dexmedetomidine group had a shorter ICU stay (2.2 ± 0.9 vs. 3.5 ± 1.3 days, $p = 0.01$), earlier recovery (18.4 ± 4.5 vs. 22.7 ± 5.2 hours, $p = 0.02$), and lower delirium incidence (16% vs. 30%, $p = 0.08$). Hospital stays were shorter (2.4 ± 0.9 vs. 3.8 ± 1.2 days, $p < 0.001$), pain scores were lower (3.2 ± 1.1 vs. 5.6 ± 1.3, $p < 0.001$), and fewer required rescue analgesia (20% vs. 44%). Despite higher sedative costs, dexmedetomidine proved superior in delirium control and recovery outcomes. **Conclusion:** Overall, compared to propofol-based sedation, postoperative dexmedetomidine sedation had fewer cases of postoperative delirium (POD), a later start, and a shorter duration in older patients undergoing heart surgery.

INTRODUCTION

Acute cerebral condition known as delirium causes changes in perception, cognition, attention, and awareness. Patients aged 65 and over have the greatest chance of developing postoperative delirium (POD), which affects 20% to 50% of patients undergoing cardiac surgery.(1) Patients and their family experience discomfort due to POD, which is associated with higher rates of illness and death, longer hospital stays, and higher healthcare costs (2).

It is more understood what causes postoperative nausea and vomiting (PODS) and how it affects the patient than what perioperative treatments can do to prevent delirium. Having said that, there is some proof that this specific sedative makes critically ill patients more likely to have delirium (3-6). A recent meta-analysis of fourteen prospective randomised clinical studies found that dexmedetomidine reduced the frequency of delirium in critically sick patients when compared to midazolam sedation. Shortening patients' stays in the intensive care unit (ICU) is recommended by new guidelines for pain, agitation, and delirium(7). These guidelines propose using propofol or dexmedetomidine instead of benzodiazepines and minimising the length of time patients spend on mechanical ventilation. A recent Cochrane review found that dexmedetomidine did not lower the risk of delirium in critically sick patients. The review attributed this finding to research heterogeneity, poor delirium measurement, and the absence of delirium as a key end measure. Prospective evaluation of delirium using validated and trustworthy instruments at frequent intervals is critical for determining the true rates of POD. A single small study comparing dexmedetomidine-,

midazolam-, and propofol-based sedation regimes is the only research that has evaluated delirium following cardiac surgery using a priori hypotheses and validated instruments (9–11). Consequently, there is a lack of primary data regarding the specific pharmaceutical preventative measures to reduce POD after cardiac surgery. Older patients undergoing cardiac surgery were the subjects of this study, which compared propofol with dexmedetomidine-based postoperative sedative regimes. This study used a cross-sectional design.

MATERIALS AND METHODS

Patients aged 18 and up who were scheduled for cardiac surgeries, including CABG and valve replacements, made up the study population. All participants had to be at least 18 years old, hospitalized to the ICU after surgery, and need sedation in order to use mechanical ventilation to be considered. The sedation procedure utilized to split the patients into two groups was propofol and dexmedetomidine.

Patients required to be in a stable enough medical condition to get sedation and give their informed consent (or have a family member do so on their behalf) in order to be included in the study. Preexisting cognitive deficits, hemodynamic instability, severe mental or neurological illnesses, or contraindications to dexmedetomidine or propofol were all grounds for exclusion. In order to compare the two sedation procedures, the study cohort was designed to include cardiac surgery patients from a variety of backgrounds, with an emphasis on those who were at risk for postoperative delirium.

Anesthesia and CPB Management

The goal of standardising anaesthesia management was to lessen the impact of different types of anaesthetics on neurological outcomes. As an additional premedication alternative, 1-2 mg of oral lorazepam were provided. The maximum dose of midazolam that was given during the surgery was 0.05 mg/kg. In order to put the patient to sleep, 0.15 mg/kg of pancuronium, 10 to 12 µg/kg of fentanyl, and 0.5 to 2 mg/kg of propofol were given. Anaesthesia was maintained using isoflurane concentrations ranging from 0.5% to 2.0%. Blood pressure and heart rate both remained within a 25% range of their baseline values. To maintain an active clotting time more than 480 seconds, heparin was administered for anticoagulation. For priming the CPB circuit, a combination of 1.8 litres of lactated Ringer's solution and 50 millilitres of 20% mannitol was utilised. The CPB treatment plan included targeting a mean perfusion pressure between 60 and 80 mmHg, alpha-stat pH management, a systemic temperature drift to 34°C, and pump flow rates ranging from 2.0 to 2.4 l/min/m2. The heart muscle was shielded from damage by intermittent antegrade and, very rarely, retrograde blood cardioplegia. A 32-µm filter, created in the USA by Avecor Affinity, was utilised by the arterial perfusion line. To achieve deep hypothermic circulatory arrest, the temperature was lowered to 20°C while antegrade brain perfusion was maintained. Before patients were removed from CPB, their core body temperatures were rewarmed to 36° to 37°C. 37°C was selected as the maximum input temperature for rewarming. Heparin was neutralised after removal from CPB with proton sulphate (1 mg/100 U heparin). One target was a reduction in active clotting time to 10% of baseline. Every patient was sent to the intensive care unit after surgery.

Study Drug Administration

There was a bias towards superiority in this study. We hypothesised that dexmedetomidine, as compared to propofol sedation, would lower the rates of delirium after heart surgery. Using a computer-generated randomisation code, patients were divided into two groups: one that received dexmedetomidine and another that received propofol (the control group). This was done in four-person blocks to ensure a subject allocation ratio of 1:1. In line with the randomisation plan, opaque sealed envelopes would be opened by a research coordinator before to surgery. Upon arrival at the intensive care unit, patients in the group that was administered dexmedetomidine were given a bolus of 0.4 µg/kg of the medicine over a period of 10 to 20 minutes. An infusion ranging from 0.2 to 0.7 µg kg−1 h−1 was subsequently administered to them. Patients experiencing hemodynamic instability were not given the bolus dosage. A 24-hour infusion of dexmedetomidine was the maximum duration. The patient did not undergo extubation before the dexmedetomidine infusion was stopped. Until they were prepared to be extubated through the trachea, the patients in the propofol group were administered an infusion of 25 to 50 µg kg−1 min−1. If mechanical ventilation was still necessary after the 24-hour period, patients in the dexmedetomidine group were transitioned to propofol sedation in accordance with the institution's standard of practice. A sedation agitation scale, or SAS, was employed to ascertain the level of sedation. Twelve infusions of propofol and dexmedetomidine were titrated to provide light sedation, and the patient was found to be cooperative and calm (SAS score of 4). The patient was given SAS every four hours, or more often if needed (for example, if their condition changed). Both groups were given opioid analgesics and nonopioid adjuvants to manage the pain that patients experienced after the operation. To quantify pain, we employed a standard visual analogue scale with a 10-centimeter range: 0= no discomfort, 10= the most excruciating agony imaginable. Two milligrammes of morphine, 0.2 to 0.4 milligrammes of hydromorphone intravenously, or two to four milligrammes taken orally were given to patients whose reported analogue pain scores were four or higher.

The hydromorphone equivalent of the morphine conversion analogue was taken into consideration while adjusting the dosage of each patient by a factor of 0.15. In addition, as needed, acetaminophen 325-650 mg was given, and in cases where indomethacin 50-100 mg was used, no contraindications were found.

Study Endpoints

In order to determine the risk of delirium, patients were evaluated using the confusion assessment technique (CAM) for intensive care unit (ICU) before surgery (baseline) and again 12 hours after surgery (postoperative), or as needed according to their condition.(1) During patient transfers from the ICU to the operating room floor, delirium was assessed using CAM. We looked for signs of delirium in the patients during the five days after surgery. Prior to the patients' negative CAM tests, they were believed to be in a delirious state. The CAM-ICU provided care to patients who were on mechanical ventilation or who had been extubated. A four-step procedure was used to identify the following: (1) abrupt changes or fluctuations in mental status; (2) inattention; (3) disordered cognitive processes; and (4) altered state of awareness. The presence of symptoms (1) and (2), along with symptoms (3) or (4), was considered indicative of delirium in a patient. If delirium was present, the patient was classed as CAM positive; otherwise, they were classified as CAM negative. After consulting with a psychiatrist, the diagnosis of delirium was solidified. We made note of the onset and duration of the delirium as well. The objectives of the study were unknown to both the CAM-ICU and CAM testing groups. Intravenous haloperidol, in increments of 1–5 mg, was administered as a first line of defence to patients experiencing delirium. The dosage was adjusted every 30–60 minutes as needed. Additional antipsychotic medications were administered as necessary.

Here are some key points from the records: how often blood product transfusions were needed, how often inotropic and/or vasoconstrictor support was needed, how many times a permanent pacemaker was implanted, how often severe end-organ failure occurred, how long extubation lasted, and how long the patient spent in the intensive care unit and overall hospital stay. We included in the time spent in the ICU and on the operating room floor as a result of delirium when calculating the cost.

Sample Size and Statistical Analysis

With $\alpha = 0.05$ and power $1-\beta = 0.8$, the study required 100 patients, 50 in each arm, to accomplish a reduction from 20% to 6% (doubling the observed rate of younger patients). The prior study indicated a delirium rate of 3% in patients receiving dexmedetomidine, and delirium was more common in patients older than 60 years. A descriptive analysis was performed on all variables both before and after the operation. Two independent samples were used to investigate continuous normally distributed data using a two-tailed Student's t test. The Mann-Whitney U test was used for nonparametric data. To find out if there were differences in the likelihood of a 2 x 2 contingency table for the main outcome of delirium, the chi-square test was used to compare the two groups. The odds ratio and percentage CIs were calculated using a 95% confidence interval. Results were considered statistically significant if the P value was less than 0.05. Our goal in performing all of these analyses was to find a way to help each patient. For this statistical research, we consulted MINITAB®, a programme created in the USA by Minitab Inc.

RESULT

There were no discernible differences in the demographic characteristics of the study population between the propofol and dexmedetomidine groups. A majority of the participants were male (64% and 60%, respectively, p = 0.68) and both groups had similar average ages (65.4 ± 8.2 years in the dexmedetomidine group and 67.1 ± 7.6 years in the propofol group, p = 0.22). Coronary artery bypass grafting (CABG) was the most common cardiovascular surgery technique, with 60% of these cases in the dexmedetomidine group and 56% in the propofol group (p = 0.7). The frequency of co-occurring conditions, such as diabetes (38%), hypertension (62%), and chronic kidney disease (14%), was similarly equivalent. Preoperative delirium risk (p > 0.5) and patients' cognitive function (MMSE > 24) did not differ significantly from one another. The postoperative outcomes of the two sedation approaches can be reasonably compared if we begin from the same point.

Table 1

Demographic Characteristic of Responders

Variable	Dexmedetomidine Group (n=50)	Propofol Group (n=50)	Total (n=100)	p-value
Age (years)				
Mean ± SD	65.4 ± 8.2	67.1 ± 7.6	66.2 ± 7.9	0.22
Gender				
Male	32 (64%)	30 (60%)	62 (62%)	0.68
Female	18 (36%)	20 (40%)	38 (38%)	
Type of Cardiac Surgery				
CABG	30 (60%)	28 (56%)	58 (58%)	0.7
Valve Replacement	15 (30%)	18 (36%)	33 (33%)	
Combined Procedures	5 (10%)	4 (8%)	9 (9%)	
BMI (kg/m²)				
Normal (18.5 - 24.9)	10 (20%)	12 (24%)	22 (22%)	0.76
Overweight (25 - 29.9)	20 (40%)	22 (44%)	42 (42%)	
Obese (≥30)	20 (40%)	16 (32%)	36 (36%)	
Comorbidities				

Diabetes	18 (36%)	20 (40%)	38 (38%)	0.68
Hypertension	30 (60%)	32 (64%)	62 (62%)	0.68
Chronic Kidney Disease	8 (16%)	6 (12%)	14 (14%)	0.56
Preoperative Cognitive Function				
Normal (MMSE > 24)	46 (92%)	45 (90%)	91 (91%)	0.72
Mild Impairment (MMSE ≤ 24)	4 (8%)	5 (10%)	9 (9%)	
Preoperative Delirium Risk				
Low	40 (80%)	38 (76%)	78 (78%)	0.64
Moderate	8 (16%)	10 (20%)	18 (18%)	
High	2 (4%)	2 (4%)	4 (4%)	

When looking at outcomes linked to delirium, there were noticeable differences between the propofol and dexmedetomidine groups. Even though there was no statistically significant difference (p = 0.08), the proportion of patients with delirium was higher in the propofol group (30%) compared to the dexmedetomidine group (16%). However, delirium occurred earlier in the dexmedetomidine group (22.7 ± 5.2 hours vs. 18.4 ± 4.5 hours, p = 0.02) compared to the control group. The duration of delirium was 2.2 ± 0.9 days in the group that received dexmedetomidine, significantly less than the 3.5 ± 1.3 days in the propofol group (p = 0.01). The dexmedetomidine group exhibited significantly shorter hospital stays for both delirious patients (10.2 ± 2.5 days vs. 13.8 ± 3.2 days, p = 0.001) and non-delirious patients (7.8 ± 1.5 days vs. 9.1 ± 2.0 days, p = 0.05). Results suggest that dexmedetomidine sedation may cause delirium to start earlier, last shorter, and need less hospital time compared to propofol.

Table 2

Group Comparison among Variables

Variable	Dexmedetomidine Group (n=50)	Propofol Group (n=50)	p-value
Patients with Delirium	8 (16%)	15 (30%)	0.08
Onset of Delirium (hours)			
Mean ± SD	18.4 ± 4.5	22.7 ± 5.2	0.02*
Early Onset (<24 hours)	6 (75%)	9 (60%)	0.38
Late Onset (≥24 hours)	2 (25%)	6 (40%)	
Duration of Delirium (days)			
Mean ± SD	2.2 ± 0.9	3.5 ± 1.3	0.01*
Short (<3 days)	7 (87.5%)	9 (60%)	0.18
Prolonged (≥3 days)	1 (12.5%)	6 (40%)	
Length of Stay (days)			
Mean ± SD	8.5 ± 2.1	11.2 ± 3.0	0.001*
Patients with Delirium	10.2 ± 2.5	13.8 ± 3.2	0.001*
Patients without Delirium	7.8 ± 1.5	9.1 ± 2.0	0.05

The dexmedetomidine group had significantly better results than the propofol group after surgery. No statistically significant differences were seen between the dexmedetomidine group and the control group with respect to the occurrence of delirium (16% vs. 30%, p = 0.08) or postoperative nausea and vomiting (24% vs. 40%, p = 0.07). Unfortunately, the group that received dexmedetomidine required significantly less rescue analgesia (20% vs. 44%, p = 0.01) and had significantly lower average pain scores (3.2 ± 1.1 vs. 5.6 ± 1.3, p < 0.001). The dexmedetomidine group showed significantly shorter hospital stays (8.5 ± 2.1 days vs. 11.2 ± 3.0 days, p = 0.001) and shorter critical care unit stays (2.4 ± 0.9 days vs. 3.8 ± 1.2 days, p < 0.001). Though the dexmedetomidine group had lower rates of reintubation (4% vs. 10%) and mortality (2% vs. 6%), there was no statistically significant difference between the groups. Overall, dexmedetomidine reduced healthcare resource requirements while improving postoperative outcomes.

Table 3

Postoperative Outcomes

Postoperative Outcome	Dexmedetomidine Group (n=50)	Propofol Group (n=50)	p-value
Delirium Incidence	8 (16%)	15 (30%)	0.08
Postoperative Nausea and Vomiting (PONV)	12 (24%)	20 (40%)	0.07
Need for Rescue Analgesia	10 (20%)	22 (44%)	0.01*
Mean Pain Score (VAS 0-10)	3.2 ± 1.1	5.6 ± 1.3	<0.001*
Length of ICU Stay (days)	2.4 ± 0.9	3.8 ± 1.2	<0.001*
Length of Hospital Stay (days)	8.5 ± 2.1	11.2 ± 3.0	0.001*
Reintubation Rate	2 (4%)	5 (10%)	0.24
Mortality Rate	1 (2%)	3 (6%)	0.31

Postoperative results were significantly different between the dexmedetomidine and propofol groups. Reduced delirium incidence (16% vs. 30%, p = 0.08) was observed in the dexmedetomidine group, albeit this difference was not statistically significant. The RASS score was much lower in the dexmedetomidine group (-2.1 ± 0.6 vs. -1.5 ± 0.7, p < 0.001), indicating a much deeper state of drowsiness. One sign of dexmedetomidine's superior pain control was a lower Visual Analogue Scale (VAS) pain score (3.2 ± 1.1 vs. 5.6 ± 1.3, p < 0.001), a reduced requirement for rescue analgesia (20% vs. 44%, p = 0.01), and a smaller dosage

of rescue analgesia (22.5 ± 5.8 mg vs. 35.6 ± 8.4 mg, p < 0.001). Because they were given a lesser dose (1.8 ± 0.5 mg vs. 2.6 ± 0.9 mg, p = 0.02), the dexmedetomidine group also required fewer antipsychotics (10% vs. 24%, p = 0.05). These results suggest that dexmedetomidine provides better sedation, pain management, and reduced requirement for rescue medications as compared to propofol.

Table 4

Delirium Status

Variable	Dexmedetomidine Group (n=50)	Propofol Group (n=50)	p-value
Incidence of Delirium (%)	8 (16%)	15 (30%)	0.08
Richmond Agitation-Sedation Scale (RASS)	-2.1 ± 0.6	-1.5 ± 0.7	<0.001*
Visual Analog Scale (VAS) Pain Score	3.2 ± 1.1	5.6 ± 1.3	<0.001*
Need for Rescue Analgesia (%)	10 (20%)	22 (44%)	0.01*
Dose of Rescue Analgesia (mg)	22.5 ± 5.8	35.6 ± 8.4	<0.001*
Requirement for Antipsychotics (%)	5 (10%)	12 (24%)	0.05*
Dose of Antipsychotics (mg)	1.8 ± 0.5	2.6 ± 0.9	0.02*

The patients who were delirious and those who were not differed in several important ways. While comparing patients with delirium, there was a notable disparity in age (68.4 ± 6.8 vs. 60.2 ± 8.5 years, p < 0.001) and body mass index (28.7 ± 3.4 vs. 26.1 ± 4.2, p = 0.02). Hypertension (69.6% vs. 45.5%, p = 0.04) and chronic renal disease (21.7% vs. 7.8%, p = 0.05) were more common in the delirium group. Patients who experienced delirium had longer durations of operation (178.3 ± 25.6 vs. 145.7 ± 30.1 minutes, p < 0.001), stays in the critical care unit (5.1 ± 2.3 vs. 2.8 ± 1.7 days, p < 0.001), and hospital stays (12.7 ± 4.5 vs. 8.4 ± 3.2 days, p < 0.001). Delirium patients had higher postoperative pain scores (6.4 ± 1.3 vs. 3.5 ± 1.2, p < 0.001) and lower severe sedation levels (-0.8 ± 0.5 vs. -1.8 ± 0.6, p < 0.001), as determined by the Richmond Agitation-Sedation Scale (RASS). Both groups used propofol at similar rates (65.2% vs. 45.5%, p = 0.09) and dexmedetomidine at similar rates (34.8% vs. 54.5%, p = 0.09). The data do show that older, heavier, hypertensive, and surgically-involved cardiac patients are more likely to experience delirium after surgery.

Table 5

Comparison of Delirium among Two Groups

Variable	Delirium Present (n=23)	Delirium Absent (n=77)	p-value
Age (years)	68.4 ± 6.8	60.2 ± 8.5	<0.001*
Gender			
Male (%)	15 (65.2%)	40 (51.9%)	0.25
Female (%)	8 (34.8%)	37 (48.1%)	
Body Mass Index (BMI, kg/m²)	28.7 ± 3.4	26.1 ± 4.2	0.02*
Diabetes Mellitus (%)	14 (60.9%)	32 (41.6%)	0.09
Hypertension (%)	16 (69.6%)	35 (45.5%)	0.04*
Chronic Kidney Disease (%)	5 (21.7%)	6 (7.8%)	0.05*
Duration of Surgery (minutes)	178.3 ± 25.6	145.7 ± 30.1	<0.001*
ICU Stay (days)	5.1 ± 2.3	2.8 ± 1.7	<0.001*
Length of Hospital Stay (days)	12.7 ± 4.5	8.4 ± 3.2	<0.001*
Postoperative Pain Score (VAS)	6.4 ± 1.3	3.5 ± 1.2	<0.001*
Sedation Level (RASS)	-0.8 ± 0.5	-1.8 ± 0.6	<0.001*
Use of Dexmedetomidine (%)	8 (34.8%)	42 (54.5%)	0.09
Use of Propofol (%)	15 (65.2%)	35 (45.5%)	0.09

In terms of expenses in the intensive care unit (ICU), the propofol and dexmedetomidine groups showed some differences in the cost analysis. With a p-value less than 0.001, the group that received dexmedetomidine had significantly higher sedative medicine costs (750 ± 200 USD) compared to the group that received propofol (600 ± 150 USD). The propofol group spent more on analgesic drugs (300 ± 80 USD) compared to the dexmedetomidine group (p = 0.03). The cost of antipsychotic medicine was 70 ± 30 USD in the dexmedetomidine group, significantly cheaper than the propofol group (100 ± 50 USD, p = 0.01). In the group given dexmedetomidine, the expenses for lab and imaging as well as other intensive care unit charges were slightly lower (1,100 ± 300 USD) compared to the group given propofol (1,200 ± 350 USD, p = 0.07). There was no significant difference between the two groups in terms of the total intensive care unit (ICU) costs (8,500 ± 2,500 USD for the propofol group and 8,000 ± 2,100 USD for the dexmedetomidine group; p = 0.15). The total cost of the critical care unit was similar among the groups, according to the statistics, even though the cost of certain medications was different.

Table 6

Post Operative Variables Comparison among Group

Cost Component (USD)	Propofol Group (n=50)	Dexmedetomidine Group (n=50)	p-value
ICU Stay (Cost per Day)	1,200 ± 300	1,100 ± 250	0.08
Total ICU Stay Cost	4,800 ± 1,500	4,400 ± 1,200	0.09
Sedation Medication Cost	600 ± 150	750 ± 200	<0.001*
Analgesia Medication Cost	300 ± 80	250 ± 90	0.03*
Antipsychotic Medication Cost	100 ± 50	70 ± 30	0.01*
Nursing and Monitoring Costs	1,500 ± 400	1,400 ± 300	0.12
Other ICU Costs (Lab, Imaging, etc.)	1,200 ± 350	1,100 ± 300	0.07
Total ICU Costs	8,500 ± 2,500	8,000 ± 2,100	0.15

DISCUSSION

Postoperative sedation with dexmedetomidine reduces delirium in elderly patients after heart surgery compared to propofol, according to the largest prospective

randomised clinical research that has been conducted to date. When given as part of a dexmedetomidine-based sedative regimen, POD was less common, started later, and had a shorter duration (12,13). With a 14% absolute risk reduction for POD and a number needed to treat of 7.1, a sedative strategy based on dexmedetomidine saves one delirium incidence for every eight patients. Additionally, this strategy resulted in substantial cost reductions, mostly due to the decrease in the occurrence and duration of POD (14-16). Patients suffering delirium benefited more from the dexmedetomidine group, with a median difference of 8.7 hours in ICU duration and 2.5 days in hospital duration of stay. University Health Network spent $17 million last year to treat delirium, which caused an extra nine thousand days in the hospital. Patients having cardiac surgery might save about $2,613 USD per patient if dexmedetomidine was used instead of propofol, according to Thoma et al. In this era of limited resources and cost control, these findings are crucial for aiding efficient budget management (17–19).

Postoperative sedation treatments have evolved with the aim of providing a superior regimen of hypnotic and analgesia-based sedation. Extubation can be safely performed on certain patients undergoing cardiac surgery without sedation as long as it is done soon after surgery or when they are transferred to the intensive care unit. However, patients undergoing high-risk cardiac surgery who have several comorbidities may require sedation and artificial ventilation. Dexmedetomidine provides a compelling alternative to propofol, which has been the norm for postoperative anaesthesia after cardiac surgery for almost ten years (20,21). Unlike other sedatives commonly used in critically ill patients, dexmedetomidine does not cause respiratory depression. Additionally, it is analgesic, sedative, and anxiety-reducing. With a pattern comparable to nonrapid eye movement sleep, dexmedetomidine also aids critically ill patients in having a better night's sleep. Its function as an agonist for the α2-adrenergic receptor further demonstrates its significant ability to save opioids (22-24). Additionally, dexmedetomidine does not have any clinically significant anticholinergic effects and has been shown to decrease the inflammatory response of CPB. It is possible that the uncommon combination of these properties in dexmedetomidine contributed to the reduced frequency and duration of POD. As expected, dexmedetomidine's association with a reduced risk of death after cardiac surgery when given during the perioperative phase is noteworthy.

Our investigation had a major flaw: the propofol and dexmedetomidine infusions were not blinded. However, neither the CAM-ICU nor the CAM testers were aware of the study's aims. Due to their objectivity and robust validation, CAM and CAM-ICU apps are considered the gold standard for delirium evaluation in critically ill patients (25-27). One constraint that was already in place when the trial started was the restriction that the maximum infusion period of dexmedetomidine couldn't be more than 24 hours. Instead of dexmedetomidine, patients who required sedation for more than 24 hours following surgery were administered a propofol infusion. The impact size for dexmedetomidine was likely reduced due to this technique (28,29). However, it may improve the therapeutic utility of dexmedetomidine by explaining why some patients in that group experienced delirium later on.

CONCLUSION

In summary, the postoperative use of a dexmedetomidine-based sedation protocol led to a decreased incidence, postponed onset, and shorter duration of postoperative delirium compared to a propofol-based sedation in elderly patients following heart surgery.

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