

Dexmedetomidine vs. Propofol in Postoperative Delirium Prevention

Montana Betts, BSN, RN, SRNA; Jaclyn Burnett, BSN, RN SRNA; Christian De Ochoa, BSN, RN, SRNA; Maciej Chec, BSN, RN, SRNA; Dr. Dwayne Accardo, DNP, CRNA

College of Nursing - The University of Tennessee Health Science Center - Memphis, TN

Purpose

To determine if the use of a general anesthetic technique with dexmedetomidine (Precedex) reduces the incidence of delirium when compared with the use of propofol (Diprivan) with a general anesthetic.

Specific Aim

Direct comparison of incidence of POD with dexmedetomidine and propofol.

Background

Postoperative Delirium (POD) is defined as an acute neurological condition involving altered consciousness, attention, cognition and perception.

Up to 80% of mechanically ventilated surgical patients will experience delirium in some form in the postoperative period. There is an increased incidence in the elderly surgical patient, especially those with poorly controlled pain and those requiring cardiopulmonary bypass during surgery.

The effects of POD include increased ventilator days, increased length of stay (LOS) in ICU and inpatient, increased healthcare cost, and increased morbidity and mortality.

Methods

Study Design: We conducted a scoping review of full-text, retrospective, peer-reviewed literature medical and nursing journals published between the years 2016-2021. We included randomized control trials (RCT), systematic reviews and meta-analyses.

Information Sources: CINAHL, PubMed, and Cochrane Review databases via University of Tennessee Health Science online library.

Duration: September 1st, 2020 through April 26, 2021

Study Population: Adult (>18yrs.) postoperative patients that underwent general anesthesia.

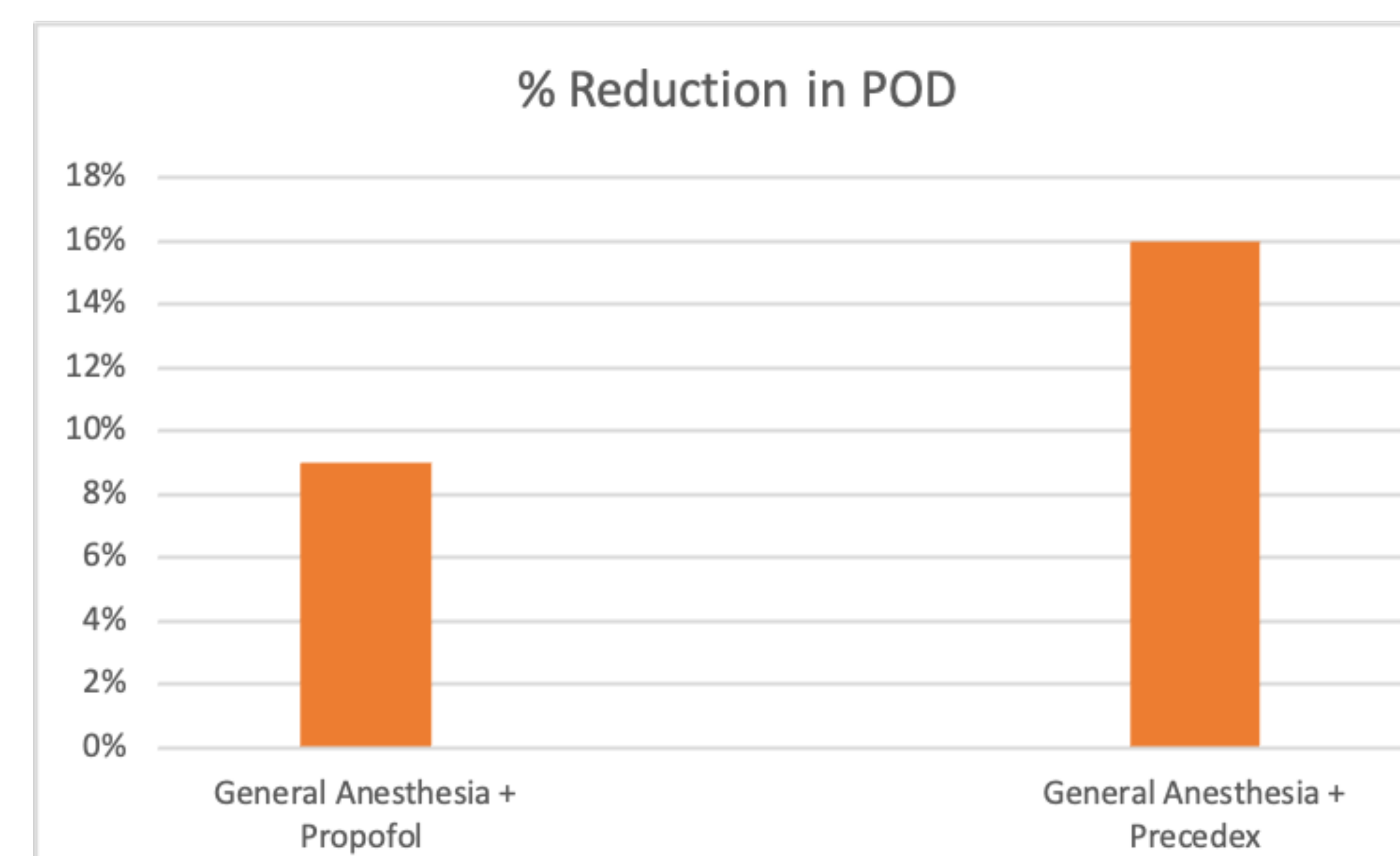
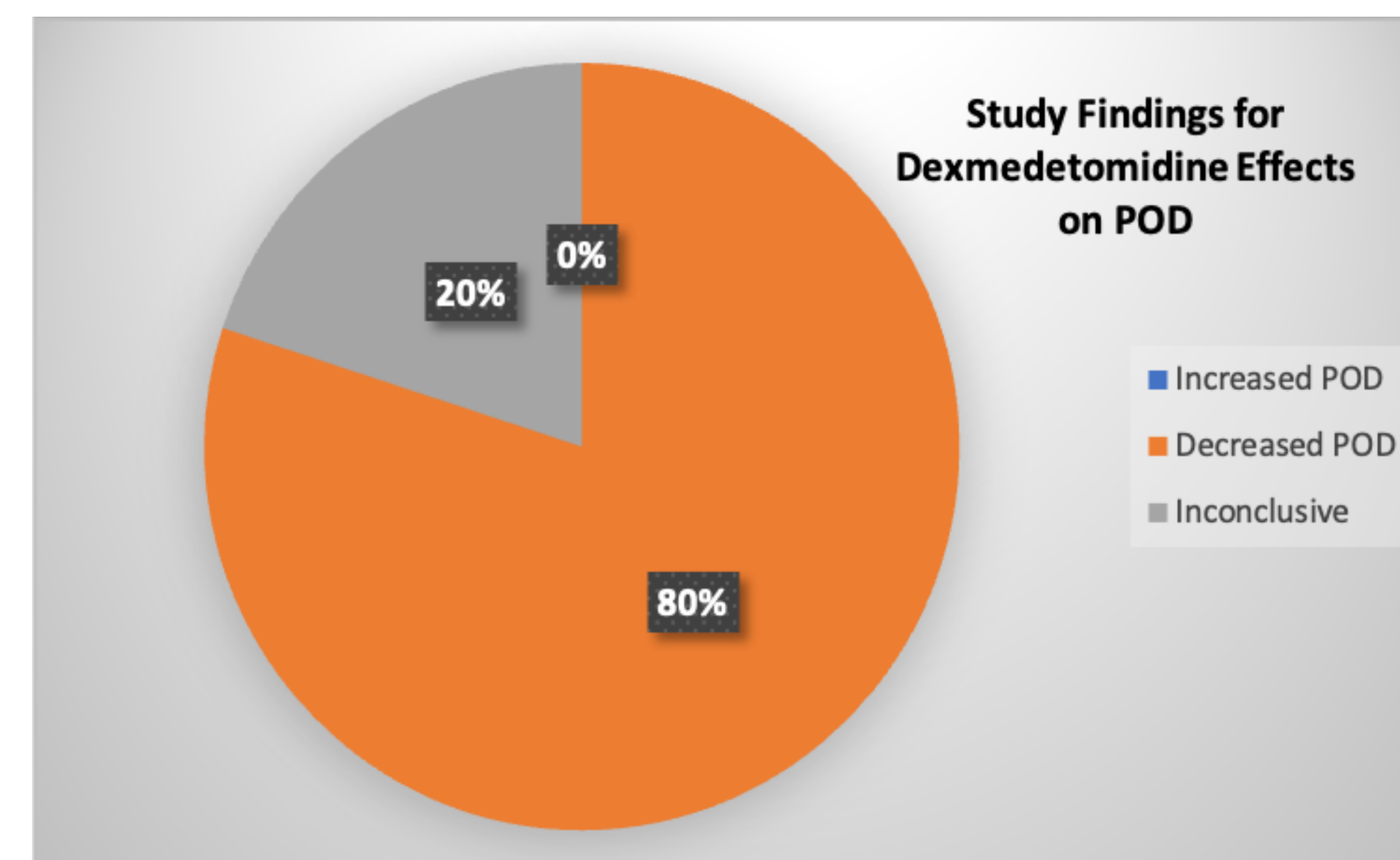
IRB: The UTHSC Institutional Review Board has deemed this project as exempt

Results

Dexmedetomidine is considered the most effective sedative agent in reducing postoperative delirium. Eight of the included studies supported this statement in the results.

Studies found a decreased reduction in the prevalence of delirium at a rate of 9% compared to 16% when comparing dexmedetomidine to propofol.

When compared with propofol, dexmedetomidine sedation reduced incidence, delayed onset, and shortened duration of POD in elderly patients after cardiac surgery.



Implications for Practice

Implementation of the confusion assessment method (CAM) allows for isolating patients at risk for POD.

Dexmedetomidine reduces pain perception via reduced norepinephrine release, it also alleviates cognitive impairment induced by acute pain and encourages early ambulation and decreased LOS in the hospital.

Continued research, as well as facility and provider promotion and participation is crucial in full-scale incorporation of dexmedetomidine into enhanced recovery after surgery (ERAS) protocols as well as common daily practice.

Summary Suggestive for Dexmedetomidine use:

- Ability to decrease pain medications
- Faster extubation times
- Decreased onset and duration of POD
- Faster ambulation and improved recovery



References

- Chuich, T., Cropsey, C. L., Shi, Y., Johnson, D., Shotwell, M. S., & Henson, C. P. (2018). Perioperative sedation in mechanically ventilated cardiac surgery patients with dexmedetomidine-based versus propofol-based regimens. *Annals of Pharmacotherapy*, 53(1), 5-12. <https://doi.org/10.1177/1060028018793254>
- Cui, Y., Li, G., Cao, R., Luan, L., & Koffi, M. (2020). The effect of perioperative anesthetics for prevention of postoperative delirium on general anesthesia: A meta-analysis. *Journal of Clinical Anesthesia*, 59, 89-98. <https://doi.org/10.1016/j.jclinane.2019.06.028>
- Deiner, S., Luo, X., Lin, H., Sessler, D., Saager, L., & Sieber, F. et al. (2017). Intraoperative infusion of dexmedetomidine for prevention of postoperative delirium and cognitive dysfunction in elderly patients undergoing major elective noncardiac surgery. *JAMA Surgery*, 152(8), e171505. <https://doi.org/10.1001/jamasurg.2017.1505>
- Djaiani, G., Silvertown, N., Fedorko, L., Carroll, J., Styra, R., Rao, V., & Katznelson, R. (2016). Dexmedetomidine versus propofol sedation reduces delirium after cardiac surgery: A randomized controlled trial. *Anesthesiology*, 124, 362-368. <https://doi.org/10.1097/ALN.0000000000000951>
- Flukiger, J., Hollinger, A., Spiech, B., Meier, V., Tontsch, J., Zehnder, T., & Siegmund M. (2018). Dexmedetomidine in prevention and treatment of postoperative and intensive care delirium: A systematic review and meta-analysis. *Annals of Intensive Care*, 89(92), 1-15. <https://doi.org/10.1186/s13613-018-0437-z>
- Liu, X., Xie, G., Zhang, K., Song, S., Song, F., Jin, Y., & Fang, X. (2017). Dexmedetomidine vs propofol sedation reduces delirium in patients after cardiac surgery: A meta-analysis with trial sequential analysis of randomized controlled trials. *Journal of Critical Care*, 38, 190-196. <https://dx.doi.org/10.1016/j.jccr.2016.10.026>
- Mei, B., Meng, G., Xu, G., Cheng, X., Chen, S., Zhang, Y., Zhang, M., Liu, X., & Gu, E. (2018). Intraoperative sedation with dexmedetomidine is superior to propofol for elderly patients undergoing hip arthroplasty. *The Clinical Journal of Pain*, 34(9), 811-817. <https://doi.org/10.1097/AJP.0000000000000605>
- Shi, C., Jin, J., Qiao, L., Li, T., Ma, J., & Ma, Z. (2019). Effect of perioperative administration of dexmedetomidine on delirium after cardiac surgery in elderly patients: A double-blinded, multi-center, randomized study. *Clinical Interventions in Aging*, 14, 571-575. <https://doi.org/10.2147/cia.s194476>
- Yu, C., Gen, L., Rong, C., Liming, L., & Koffi, M. (2020). The effect of perioperative anesthetics for prevention of postoperative delirium on general anesthesia: A network meta-analysis. *Journal of Clinical Anesthesia*, 59, 89-98. <https://doi.org/10.1016/j.jclinane.2019.06.028>
- Winings, N. A., Daley, B. J., Bollig, R. W., Roberts, R. F., Radtke, J., Heidel, R. E., Jessica, E. T., & McMillen, J. C. (2020). Dexmedetomidine versus propofol for prolonged sedation in critically ill trauma and surgical patient. *The Surgeon*. <https://doi.org/10.1016/j.surge.2020.04.003>