Acta Anaesth. Bel., 2025, 76 (3): *153-155*

Editorial

Shedding Light on the Invisible Risk: The Crucial Role of Preoperative Cognition in Postoperative Delirium

Meco B. C.[1], Radtke F. M.[2]

[1]Department of Anaesthesiology and Intensive Care, Ankara University Faculty of Medicine, Ibni Sina Hospital, Ankara, Turkey. Ankara University Brain Research Center (AÜBAUM), Ankara, Turkey; [2]Department of Anesthesia and Intensive Care, Hospital of Nykøbing Falster, Nykøbing Falster, Denmark; Charité, Universitätsmedizin Berlin, Berlin, Germany.

Corresponding author: Department of Anaesthesiology and Intensive Care, Ankara University Faculty of Medicine, Ibni Sina Hospital, Ankara, Turkey. Ankara University Brain Research Center (AÜBAUM), Ankara, Turkey.Tel: +90 532 4179911 - Email: basakceyda@hotmail.com

Comment on: Preoperative cognitive status is a major contributing factor to postoperative delirium in cardiac surgery: A post-hoc analysis of a prospective study.

Perioperative neurocognitive disorders (PNDs) stand as the leading surgical complication among older patients undergoing surgery[1]. Within this spectrum, postoperative delirium (POD) represents a major acute manifestation, especially prevalent in high-risk populations such as those undergoing cardiac surgery. POD is not only clinically significant but is also one of the most prominent and distressing patient-reported outcome measures (PROMs), as it harms recovery, leads to longer hospital stays and raises mortality risks while causing long-term cognitive deterioration. Despite its serious clinical and economic implications, predictive factors for POD remain incompletely understood and are not consistently assessed in routine practice.

The recent article by Momeni et al., "Preoperative cognitive status is a major contributing factor to postoperative delirium in cardiac surgery: A post-hoc analysis of a prospective study", contributes essential insight by emphasizing preoperative cognitive status as a powerful, yet often under-recognized, predictor of POD[2].

The incidence of POD following cardiac surgery is reported to be as high as 50%, contributing significantly to postoperative complications, extended hospital stays, and increased mortality[3,4]. Current predictive models focus mainly on age-related factors, together with comorbidities, surgical complexity , and intraoperative elements. Cardiac surgery patients who experience preoperative depression and have multiple health conditions and advanced age have been documented as at risk for developing postoperative delirium according to repeated studies[5]. However, cognitive reserve—the brain's resilience to pathological damage— functions as both a protective factor against postoperative delirium (POD) and as a risk factor that can be modified to prevent this condition[6].

The study by Momeni et al. challenges the traditional focus on purely physiological predictors and redirects attention toward the brain. It reminds us that cognitive resilience may be just as critical as cardiac reserve in preparing patients for surgery. By framing preoperative cognitive status not just as a marker but as a modifiable and actionable element, the study strengthens the case for preoperative neuro-prehabilitation and for developing real-world, brain-protective strategies throughout the perioperative period.

The authors conducted a thorough post-hoc analysis of prospectively gathered data to prove that initial cognitive impairment directly links to POD occurrence in cardiac surgery patients. The analysis shows that cognitive assessment provides distinct and cumulative value to perioperative risk evaluation because it persists as a significant predictor after controlling for established clinical factors. These findings support the implementation of brain function protective measures as a preventive approach, which should become part of standard preoperative procedures.

In parallel, value-based medical care has gained power as a modern healthcare model, centered on providing care that is both patient-centered and aligned with individual goals and values. PROMs are increasingly recognized as essential tools in this model, helping clinicians tailor decisions based on what matters most to patients[7]. Ideally, perioperative clinical decisions should involve the entire care team, including the patient and their caregivers, with PROMs serving as a shared platform for planning and communication.

This is where the concept of patient-centered precision care (PC^2) has emerged as a new concept that delivers individualized perioperative anesthesia care through a comprehensive approach that uses each patient's unique characteristics to develop personalized perioperative care plan[8].

The concept of patient-centered precision care not only prioritizes PROMs but also emphasizes the integration of systematic feedback mechanisms into perioperative care pathways. By doing so, it seeks to prevent avoidable complications, including postoperative delirium (POD), while delivering improved short- and long-term outcomes in a manner truly aligned with the individual patient.

Several aspects of the study make it particularly valuable for the PC^2 concept, as it underscores the importance of preoperative cognitive assessment and presents strong multivariate evidence supporting its predictive role.

The assessment of preoperative cognitive status should move beyond its current status as a background characteristic to become a vital element for perioperative planning. The PC^2 approach enables healthcare providers to develop customized perioperative care for patients that might include additional monitoring and cognitive 'prehabilitation' before surgery.

This approach aligns with the growing call to implement the European Society of Anaesthesiology and Intensive Care Medicine evidence-based and consensus based guideline on postoperative delirium in adult patients, into real-world practice through individualized, risk-adapted care[9].

From a systems perspective, the study's implications are far-reaching. The findings support the creation of multidisciplinary brain-focused care pathways that the Safe Brain Initiative (SBI) . The SBI is a nonprofit, guideline-directed initiative that offers an evidence-based bundle of care aimed at monitoring and improving patient-reported outcome measures (PROMs), including POD and other perioperative neurocognitive disorders (PNDs), across all surgical populations. The framework helps healthcare professionals transform clinical guidelines into operational team-based protocols through anesthesiologists' and surgeons' collaboration with geriatricians and neuropsychologists and nurses and patients in shared-care models[10].

Early implementation results of the SBI approach across diverse clinical settings have shown a significant reduction in POD incidence, reinforcing the importance of integrating accessible tools and systematic feedback systems into routine care[11]. These findings highlight the potential of structured, brain-centered interventions to improve outcomes and make guideline-based practices more feasible in the real world.

Conclusion

The work by Momeni et al. offers a timely and impactful reminder that surgical outcomes are shaped well beyond the operating room. The cognitive state of a patient entering surgery can significantly influence their postoperative trajectory. By drawing attention to this often-overlooked domain—particularly perioperative cognition and its reflection in patient-reported outcome measures (PROMs)— this study helps lay the groundwork for a more holistic, brain-centered approach to perioperative care.

It is time we stop treating the brain as an innocent bystander—not only in cardiac surgery, but across all surgical disciplines—and start preparing our patients for the journey with a patient centered precision care approach.

References

1. Evered L, Silbert B, Knopman DS, Scott DA, DeKosky ST, and Rasmussen LS. et al. Recommendations for the nomenclature of cognitive change associated with anaesthesia and surgery–2018. Br J Anaesth. 2018 Nov;121(5):1005–1012. doi:10.1016/j.bja.2017.11.087. Epub 2018 Jun 15.
2. Momeni M, Tircoveanu R, Kahn D and Khalifa C. Preoperative cognitive status is a major contributing factor to postoperative delirium in cardiac surgery: A post-hoc analysis of a prospective study
3. Gara BP, Muller A, Gasangwa DVI, Patxot M, Shaeffi S, and Khabbaz K, et al. Prevention of early postoperative decline: A randomized, controlled feasibility trial of perioperative cognitive training. Anesth Analg. 2020;130(3):586–595.
4. Inouye SK, Westendorp RG, and Saczynski JS. Delirium in elderly people. Lancet. 2014;383(9920):911–922.
5. Chen H, Mo L, Hu H, Ou Y,and Luo J. Risk factors of postoperative delirium after cardiac surgery: a meta-analysis. J Cardiothorac Surg. 2021;16:113.
6. Berger M, Terrando N, Smith SK, Browdyke JN, Newman MF, Mathew JP. Neurocognitive function after cardiac surgery: from phenotypes to mechanisms. Anesthesiology. 2018;129(5):829–851.
7. Lim S, Duncan PW, Groban L, Segal H, Abbott RM, and Williamson JD. Patient-reported outcome measures (PROMs) as a preoperative assessment tool. J Anesth Perioper Med. 2017;4:274–281.
8. Berger-Estilita J, Marcolino I, Radtke FM. Patient-centered precision care in anaesthesia – the PC-square (PC)² approach. Curr Opin Anaesthesiol. 2024;37(2):163–170.
9. Aldecoa C, Bettelli G, Bilotta F, Sanders RD, Audisio R, and Borozdina A, et al.; Nomenclature Consensus Working Group. Update of the European Society of Anaesthesiology and Intensive Care Medicine evidence-based and consensus based guideline on postoperative delirium in adult patients. Eur J Anaesthesiol. 2024;41(2):81–108.
10. Meço BC, Borda de Agua Reis A, Berger-Estilita J, Jakobsen K, Alkış N, and Radtke FM. Precision anaesthesia: Advancing patient-centered precision care through repetitive assessment of PROMs with the Safe Brain Initiative approach. Turk J Anaesthesiol Reanim. 2023;51(5):374–379.
11. Meço BC, Jakobsen K, De Robertis E, Buhre W, Alkış N, and Kirkegaard PR, et al. A first assessment of the Safe Brain Initiative care bundle for addressing postoperative delirium in the postanesthesia care unit. J Clin Anesth. 2024 Oct;97:111506.

doi.org/10.56126/76.3.21