Perioperative neurocognitive disorders

Perioperative neurocognitive disorders are a group of conditions characterised by changes in cognitive function, which affect older people after surgery and anaesthesia. Multicomponent interventions may reduce the impact of perioperative neurocognitive disorders on patients and healthcare systems.

Stuart Connal[1]

Author details can be found at the end of this article

Correspondence to:
Stuart Connal;
stuart.connal@nhs.net

Introduction

The surgical population is ageing: by 2030, one in five people in England over 75 years old will undergo surgery each year (Fowler et al, 2019). The incidence of perioperative neurocognitive disorders in older patients undergoing non-cardiac surgery is approximately 30% at 1 week, 10% at 3 months and 1% at 1 year (Abildstrom et al, 2000; Paredes et al, 2016). Perioperative neurocognitive disorders are associated with adverse outcomes, increased length of hospital stay, and increased risk of perioperative and long-term mortality (Peden et al, 2021). Consequences for patients include loss of independence, increased health and social care burden, and progression to permanent cognitive impairment.

Updated definitions

Perioperative neurocognitive disorders were previously referred to under the umbrella of postoperative cognitive dysfunction but updated nomenclature to clarify diagnostic criteria (Evered et al, 2018) aligns with the Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM-5), improving integration with medical, allied health and social support:

- Preoperative mild or major neurocognitive disorders: decline in cognitive function with impairment of activities of daily living beyond normal ageing
- Postoperative delirium: an acute fluctuating disturbance in attention, awareness and cognition presenting within 7 days of surgery or before hospital discharge
- Delayed neurocognitive recovery: features of a neurocognitive disorder lasting up to 30 days postoperatively
- Postoperative neurocognitive disorder: mild or major neurocognitive disorder lasting up to 12 months postoperatively but may persist longer.

Preoperative screening and risk factors

Screening facilitates optimisation of risk factors and diagnosis of previously unrecognised conditions. Predisposing risk factors include advanced age, malnutrition, hearing or sight loss, previous delirium or cognitive impairment, multimorbidity and frailty. The 4 'As' Test (4AT) is a validated screening tool for delirium (Aldwikat et al, 2022). Diagnosis of other perioperative neurocognitive disorders involves neuropsychological and activities of daily living assessments.

Precipitating factors include hospital admission, urgency and duration of surgery, urinary catheters, polypharmacy, dehydration, sleep deprivation and severe illness. Preoperative comprehensive geriatric assessment has been demonstrated to reduce the incidence of perioperative neurocognitive disorders (Eamer et al, 2018).

Perioperative care

Multimodal interventions which may reduce the incidence of perioperative neurocognitive disorders include modification of preoperative risk factors, avoiding benzodiazepines, using fascia iliaca blocks in hip fractures, effective analgesia, and intraoperative processed electroencephalography (pEEG) monitoring to avoid excessive depth of anaesthesia. Early interventions for hip fractures or stroke may also reduce the development of perioperative neurocognitive disorders.

How to cite this article:
Connal S. Perioperative neurocognitive disorders. Br J Hosp Med. 2023. https://doi.org/10.12968/hmed.2023.0184

Postoperative care

Management of postoperative delirium includes proactive screening, minimising risk factors and treating possible causes. Multidisciplinary bundles include regular orientation, sensory aids, daily visitors, sleep hygiene, early mobilisation and minimising indwelling lines.

Consensus recommendations

Key recommendations from the international Perioperative Brain Health Initiative (Peden et al, 2021) to reduce the incidence of perioperative neurocognitive disorders include:

- Education and training of healthcare professionals
- Cognitive screening in patients who are at risk
- Preoperative and postoperative screening for delirium
- Multidisciplinary interventions to prevent delirium
- Multimodal pain management
- Avoidance of antipsychotics and anxiolytics, particularly benzodiazepines.

Conclusions

Perioperative neurocognitive disorders are common in older patients undergoing surgery and anaesthesia. Updated nomenclature facilitates diagnosis, management and integration with community support. Prevention and treatment strategies include screening patients who are at risk, addressing modifiable risk factors throughout the perioperative pathway, and implementing multicomponent bundles of care.

Author details

[1]Central London School of Anaesthesia, London, UK

References

Abildstrom H, Rasmussen LS, Rentowl P et al. Cognitive dysfunction 1-2 years after non-cardiac surgery in the elderly. Acta Anaesthesiol Scand. 2000;44(10):1246–1251. https://doi.org/10.1034/j.1399-6576.2000.441010.x

Aldwikat RK, Manias E, Tomlinson E et al. Delirium screening tools in the post-anaesthetic care unit: a systematic review and meta-analysis. Aging Clin Exp Res. 2022;34(6):1225–1235. https://doi.org/10.1007/s40520-021-02057-w

Eamer G, Taheri A, Chen SS et al. Comprehensive geriatric assessment for older people admitted to a surgical service. Cochrane Database Syst Rev. 2018;1(1):CD012485. https://doi.org/10.1002/14651858.CD012485.pub2

Evered L, Silbert B, Knopman DS et al. Recommendations for the nomenclature of cognitive change associated with anaesthesia and surgery—2018. Br J Anaesth. 2018;121(5):1005–1012. https://doi.org/10.1016/j.bja.2017.11.087

Fowler AJ, Abbott TEF, Prowle J et al. Age of patients undergoing surgery. Br J Surg. 2019;106(8):1012–1018. https://doi.org/10.1002/bjs.11148

Paredes S, Cortínez L, Contreras V et al. Post-operative cognitive dysfunction at 3 months in adults after non-cardiac surgery: a qualitative systematic review. Acta Anaesthesiol Scand. 2016;60(8):1043–1058. https://doi.org/10.1111/aas.12724

Peden CJ, Miller TR, Deiner SG et al. Improving perioperative brain health: an expert consensus review of key actions for the perioperative care team. Br J Anaesth. 2021;126(2):423–432. https://doi.org/10.1016/j.bja.2020.10.037