1. Introduction

Postoperative cognitive dysfunction (POCD) is a condition that impairs the ability to experience and remember events during a surgical treatment. It has been recognized as a result of anesthesia since 1887 and as a complication of cardiac surgery since the 1950s. Over the course of more than six decades, numerous recommendations have been proposed for the detection of postoperative cognitive dysfunction (POCD). Postoperative cognitive dysfunction, by definition, refers to a decline in cognitive function following surgical surgery. The psychometric evaluation for perioperative diagnosis. The observed clinical manifestations are minor and varied. Nevertheless, several medical professionals questioned the potential correlation between surgical procedures or severe illnesses and the manifestation of cognitive impairment.1-4 Thus, it is still uncertain if either POCD or a serious illness can trigger the onset of dementia.

Risk factors for postoperative cognitive dysfunction (POCD)

Modifiable risk factors

Excessive exposure to anesthetic medicines can often be the determining factor, depending on the extent of the anesthetic's impact. General anesthesia may not increase the incidence of postoperative cognitive dysfunction (POCD). Due to the lack of
intravenous sedation in most patients, the study was unable to compare the distinction between general anesthesia and regional anesthesia. Therefore, additional investigations should be conducted.\textsuperscript{5,6}

**Inalterable risk factors age**

Those aged 60 and older had a higher prevalence of POCD compared to those below this age group. The process of aging can lead to a decrease in the functioning of brain cells, resulting in a prolonged period of postoperative cognitive dysfunction (POCD). The malleability of the human brain’s cells in response to cognitive training and physical therapies suggests that they could be beneficial in preventing and treating postoperative cognitive dysfunction (POCD). The extent to which the aging brain increases in plasticity to benefit from the procedure remains unclear, highlighting the need for further research in this area. Individuals aged 60 years or older have a decline in the functioning of several regulatory mechanisms, including mental frailty and physical decline. To evaluate the physiological and psychological pressures experienced during surgical procedures and anesthesia. Advanced age is associated with changes in pharmacodynamics and pharmacokinetics, such as reduced clearance of drugs by the liver and kidneys, a longer elimination half-life, and altered drug sensitivities. Complex and extensive procedures such as thoracic, vascular, and abdominal surgery carry a higher risk compared to simpler and lesser procedures like outpatient surgery. The occurrence of postoperative cognitive dysfunction (POCD) is frequently observed in patients who undergo cardiac surgery. This condition has been associated with the presence of microemboli, which can result in localized cerebral infarctions and subsequent cognitive impairment after the use of a cardiopulmonary bypass pump.\textsuperscript{3,6}

**Mechanism**

The precise effects of surgery and anesthesia on cognitive function remain uncertain. Experimental studies on animals have provided evidence of an immunological response to surgical procedures. In mice, a surgical procedure triggers the activation of the protein TNFα/NF-κB signaling pathway, leading to the release of cytokines that disrupt the integrity of the blood-brain barrier. Peripheral surgical trauma induces inflammation in the central nervous system, which disrupts the blood-brain barrier (BBB) and interferes with neuronal activity, resulting in postoperative cognitive dysfunction (POCD). Multiple inflammatory mediators govern each individual component. This incident may accelerate the deterioration of neurocognitive function in groups that are already neurocognitively fragile. The cognitive function of each individual is impacted by the influence of anesthetic medicines, which is contingent upon the pharmacokinetics and pharmacodynamics of the administered agents. The duration of action of anesthetic medications may have an impact on cognitive disruption during the postoperative period, resulting in a shorter duration. Nevertheless, there is no conclusive evidence to suggest that anesthetic medication directly causes persistent postoperative cognitive dysfunction (POCD).\textsuperscript{7-10}

**Measurement**

The diagnosis of postoperative cognitive dysfunction (POCD) was evaluated both before and after the surgical procedure to assess cognitive function. This diagnosis was confirmed through psychometric testing. The test comprised activities including memorization of numerical sequences, manual coordination, multitasking, and a word recall assessment. An assessment tool for dementia can be utilized to evaluate the long-term risk factor of postoperative cognitive deterioration. The MMSE can be readily employed in regular clinical practice due to its practicality and straightforward method.\textsuperscript{11,12}

**Prevention and therapy**

The prevention of postoperative cognitive dysfunction (POCD) was categorized into three groups: reasons for surgery, surgical approaches, and anesthesiology techniques. A neurological examination should be conducted to evaluate cognitive assessment. The significance is specifically associated with the prevention of problems that occur during and after surgery. The minimally invasive treatment has
demonstrated that it may not increase the incidence of postoperative cognitive dysfunction (POCD). However, these procedures are less likely to elicit postoperative cognitive dysfunction (POCD) due to the stress on the tissue, resulting in a reduced inflammatory response. The duration of the effect of anesthetic medicine may impact the extended cognitive impairment experienced throughout the postoperative period. The administration of sedative medications prior to a medical procedure may interfere with memory function. One such example is midazolam. Therefore, a thorough evaluation of the potential impact should be conducted. A study was done to see how often memory problems happened one day after surgery in people who had been given midazolam as a premedicant and then had one to two hours of general anesthesia with remifentanil and propofol as the anesthetics. Administration of lidocaine did not have a significant impact on the prevention of postoperative cognitive dysfunction (POCD). The use of lidocaine infusions has a significant impact on mitigating the loss of cognitive function in non-diabetic patients. Intraoperative treatment of magnesium does not prevent postoperative cognitive dysfunction (POCD), despite the persistent therapeutic effects of magnesium on cognitive function in obese patients. Despite its potential to enhance visuospatial cognitive function, pexelizumab, a complement suppressor, did not have any impact on the risk of postoperative cognitive dysfunction (POCD).\textsuperscript{13-14}

2. Conclusion

POCD has a persistent impact on an individual’s functional status and overall quality of life. The past history of neurocognitive disturbance appears to strongly indicate the presence of postoperative cognitive dysfunction (POCD), and POCD can manifest deficits even in the absence of clinical identification. Neuroinflammation plays a significant role in the development of postoperative cognitive dysfunction (POCD), ranging from damage to peripheral nerves to neuronal death and resulting in functional impairments. The prevention of postoperative cognitive dysfunction (POCD) involves the early identification and mitigation of potential risk factors during the perioperative period. To minimize hospitalization duration, preventive strategies should evaluate the collaboration between surgeons and anesthesiologists, taking into account the specific surgical procedures, in order to mitigate the inflammatory reaction. POCD can be characterized as a lack of resistance when confronted with perioperative stress. As physicians, we must consider numerous contributing elements that can enhance postoperative healing.

3. References

8. Mclean AJ, Le Couteur DG. Aging biology and


