

Post-operative Delirium in Geriatric Patients

M.A.Mansour, E.S.Abd el-azeem, M.H.Abd el- Fattah ,A.A.Dawood

Anesthesiology and Intensive Care ,Dept., Faculty of Medicine, Benha Univ., Benha, Egypt
Mohamed.abdelrazik21@fmed.bu.edu.eg

Abstract

Background: Every day around the world many patients receive general anesthesia to safely undergo surgeries. Most of those patients receiving general anesthesia are elderly 65 years of age or older. Delirium is a term meaning “sudden confusion. .” It refers to a sudden change in mental function. It can cause people to be either aggressive and agitated or sleepy and inactive or sometimes a combination of both. Immediately after surgery that requires anesthesia, it is normal for geriatric patients to feel somewhat mental confusion, sleepy or a little out of normal cognition. But when patients encounter marked deterioration in mental function such as confusion, disorientation, persistent sleepiness, hallucinations, agitation, or aggression they might be suffering post-operative delirium.

Key words: Delirium, Geriatric Patient, Post-operative.

1.Introduction

Postoperative delirium is a common complication affecting older adults after undergoing surgery and is usually associated with increased morbidity and mortality rate. Prompt management of postoperative delirium requires an understanding of who are at the highest risk for suffering postoperative delirium and successful approach to diagnosis and early treatment.(10).

Also, postoperative delirium (POD) is a neuropsychiatric syndrome commonly occurring in hospitalized surgical patients but often undiagnosed complication in the elderly following a major operation. and is usually associated with cognitive deterioration, functional decline, high morbidity and mortality, increased length of hospital stay, increased days of mechanical ventilation and ICU length of stay. The reported incidence of postoperative delirium for the elderly is from (10% to 15%) depending on the criteria used for diagnosis, the studied population and the type of surgical operation. (3).

IN addition, Post operative delirium in older adults has certain manifestations as reduced awareness of the environment , decreased ability to focus attention , memory disturbances , disorientation to time, place and person, language disturbances such as inability to name objects and may present with rambling speech , perceptual disturbance such as hallucinations, illusions or misinterpretations and the old adult can easily be distracted .(6).

Moreover, delirium is acute postoperative psychosis with manifestations which fluctuates throughout the course of the illness. It is a complex syndrome with variable clinical picture including acute confusional state, acute brain syndrome and mental dysfunction. clinicians must maintain a high index of suspicion to effectively detect postoperative delirium. It is manifested by an acute or subacute fluctuation from baseline mental condition, hence it is necessary to detect each patient's baseline cognitive status

to be capable of diagnosing the condition. The diagnosis of delirium requires history, physical examination, laboratory, and radiographic findings. Other neurocognitive disorders should be excluded to confirm the diagnosis. (3).

The pathophysiology of postoperative delirium is not definite as delirium most probably results from an imbalance in the synthesis, release and inactivation of neurotransmitters which are normally responsible for coordinating cognition, mood and behavior. Specific neurotransmitter systems involved in the development of delirium include norepinephrine, serotonin, glutamate, dopamine, aminobutyric acid, melatonin levels and the cholinergic pathway and also the oxidative stress theories. These two areas likely interact to cause delirium by promoting neurotransmitter dysregulation and network disconnectivity causing an imbalance in the activation or inhibition of neural networks (in specific cholinergic and GABAergic systems). The oxidative stress hypothesis proposes that brain hypoperfusion causes local ischemia which triggers a chain of events precipitating occurrence of delirium.(1).

Delirium is a disturbance in attention, awareness, and cognition that develops over a short period of time and varies in severity. Delirium usually begins within 24 hours and resolves within 48 hours postoperatively. There are various types of delirium as hyperactive, hypoactive and mixed type. the hypoactive subtype may be associated with the worst prognosis. .(4).

Also, postoperative delirium can be classified into further subtypes according to setting . Post anesthesia care unit (PACU) delirium is a further subtype of postoperative delirium that occurs in the PACU. Intensive care unit (ICU) delirium is defined by its identification in the ICU; there may be some overlapping depending on when patients are admitted to the ICU. Emergence agitation

occurs on emergence from anesthesia and has specific techniques of management. (6).

Multiple predisposing factors may contribute to occurrence of delirium as reduced cognitive reserve due to advanced age (>65 years old), neuropsychiatric conditions as cognitive dysfunction, dementia, depression, use of psychotropic medications, history of postoperative delirium, history of stroke, poor physical status, functional disability, medical comorbidities, heart failure, diabetes mellitus, atrial fibrillation, anemia, reduced physical reserve due to atherosclerotic disease, renal impairment, pulmonary disease, alcohol abuse, tobacco use, sensory impairment (vision, hearing), malnutrition and dehydration. The risk of postoperative delirium is associated with many factors as the depth of anesthesia, increased surgical duration, complexity, and invasiveness. (9).

Also, Geriatric patients with a depleted physiologic reserve have an increased risk of postoperative decompensation, accordingly multiple body system organs are affected including the brain and the cognitive status precipitating occurrence of delirium. There are many postoperative factors can precipitate the occurrence of delirium including admission to an intensive care unit, prolonged intubation, mechanical ventilation, poor pain management, and disturbed sleep patterns. (8).

Postoperative delirium can have multiple causes and should be promptly evaluated by an anesthesiologist in the PACU. A thorough medical history, a complete listing of medications administered during the perioperative period, and review of the anesthesia and surgical course including the type of surgery should be obtained. Then a detailed physical examination and any indicated laboratory testing are performed. Assessment of the patient's breathing and circulatory status is extremely important to rule out life-threatening problems such as hypoxia, hypercarbia, and airway obstruction. Delirium can be detected, screened and diagnosed through many variant tools as the Confusion Assessment Method (CAM) and the Delirium Symptom Interview (DSI). Routine screening of at-risk patients using a suitable screening tool facilitates early diagnosis, particularly in the hypoactive form of delirium which is usually difficult to be diagnosed. However, it can be particularly challenging to diagnose delirium in patients with preexisting cognitive impairment, dementia, or psychiatric conditions. (2).

Prevention, screening, and early treatment are the key management techniques of delirium. Most of the preventive strategies

are nonpharmacologic as a proactive geriatrics consultation, structured geriatrics consultations regarding supplemental oxygen, fluids, electrolytes, nutrition, pain management, early mobilization and physical rehabilitation. Various studies recommended managing the following 6 issues: cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment, and dehydration to aid in prevention of delirium. (5).

The pharmacologic methods can be also particularly effective when kept up with managing underlying causes of delirium such as pain or sleep deprivation. The use of antipsychotics should be maintained for patients who are severely agitated and are at risk to harm themselves or others. The prophylactic use of ketamine or antipsychotics has shown some early success in the prevention of delirium. (7).

The transient mental dysfunction affects the patient's health and health care costs. This condition leads to increased morbidity, delayed functional recovery, and prolonged hospital stay. The adverse effects of postoperative delirium on health and health care costs make early diagnosis and prompt treatment very important. Since anesthesiologists have an important role in the perioperative management of elderly patients undergoing surgery, it is necessary for them to have a good understanding of postoperative delirium and the skills required for the perioperative care of geriatric patients including the ability to identify high-risk patients, promptly diagnose and effectively manage the case. There has been no definitive analysis of postoperative delirium in the elderly with emphasis on anesthesia care; therefore we undertook this study to present such an analysis. (11).

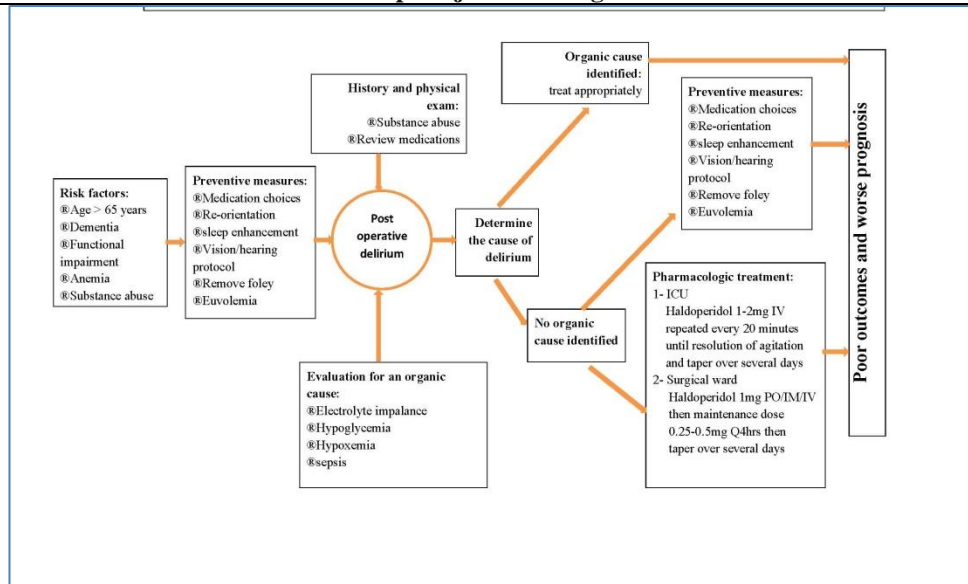


Fig1. Postoperative delirium in the elderly – A diagnostic and treatment algorithm.(14)
Table 1: The Minimental Scale Examination-CGA Toolkit:for diagnosis of delirium(13)

Category	Possible points	Description
Orientation to time	5	From broadest to most narrow. Orientation to time has been correlated with future decline. What is the year, season, date, day, month?
Orientation to place	5	From broadest to most narrow. This is sometimes narrowed down to streets and sometimes to floor. Where are we---state, country, town, hospital, floor?
Registration	3	Repeating named prompts Name three objects-1 s to say each. Then ask the patient all three after you have said. Then repeat them until he learns all three. Count trials and record trials.
Attention and calculation	5	Serial sevens, or spelling "world" backwards. It has been suggested that serial sevens may be more appropriate in a population where English is not the first language. Serial 7s. One point for each correct. Stop after five answers. Alternatively, spell "world" backwards.
Recall	3	Registration recall .Ask for the three objects repeated above. Give one example of each.
Language	2	Naming a pencil and a watch. Name a pencil and watch (2 points). Repeat the following: "No ifs, ands or buts" (1 point). Read and obey the following: Close your eyes (1 point). Write a sentence (1 point). Copy design (1 point).
Repetition	1	Speaking back a phrase
Complex commands	6	Varies. Can involve drawing figure shown.

2.Significance of the study:

Perioperative complications specific to elderly patients are becoming increasingly relevant with an aging population. Postoperative delirium is a quintessential geriatric complication. The incidence ranges from 9% to 87% depending on both the patient population and the degree of operative stress.

The recognition and treatment of delirium is critically important because postoperative delirium is associated with poor outcomes including functional decline, longer hospitalization, institutionalization, greater costs, and higher mortality. The purpose of this study is to describe the diagnosis and treatment of postoperative delirium. (12).

3.Aim of the Study

The aim of this study was to present a practical framework for developing and implementing programs and techniques in prevention and treatment of postoperative delirium in geriatric patients in anesthesiology and critical care medicine that are both scientifically sound and feasible and to equip the health care professional caring for older adults in the perioperative setting with a set of evidence-based recommendation statements regarding the optimal techniques for prevention of delirium and care of older adults with delirium

4.Conclusion

Delirium is a common but often undiagnosed problem in the elderly following a major surgery. Recognizing the clinical feature of delirium and the criteria to establish the diagnosis of delirium will enhance a clinician's ability to determine this problem. Delirium can be diagnosed with ease and brevity with delirium assessment tools such as the CAM-ICU.

Also, postoperative delirium is a common problem affecting geriatric surgical patients and is usually associated with increased morbidity and mortality. Optimal management of postoperative delirium requires an understanding of which patients are at the highest risk for developing (POD) and a proactive approach to diagnosis and treatment.

Initial treatment of delirium should be with environmental and supportive interventions which can be considered as preventative in patients with multiple risk factors. Subsequently, pharmacologic treatment is implemented. Successful management of postoperative delirium reduces the incidence, duration, and side effects of this common problem in geriatric postoperative patients.

Additionally, multicomponent intervention strategies, the use of antipsychotics, BIS-guided anaesthesia, and administration of dexmedetomidine during anaesthesia can successfully reduce the incidence of delirium. By adding these interventions to already existing multicomponent and multidisciplinary strategies, the incidence of delirium might be reduced even further.

Moreover, other adverse postoperative outcomes could potentially be prevented by combining these approaches. In order to gain further desired outcomes, measures to overcome precipitating & predisposing risk factors should be used in combination with any other proven successful measure to optimize the desired results. In

elective surgical patients, a potential for reducing the incidence of postoperative delirium depends mainly on pre-admission phase. Multimodal prehabilitation pathways should therefore be considered for investigation

5.Summary

Postoperative delirium is common in the elderly in the postoperative period. It can cause increased morbidity and mortality, delayed functional recovery, and prolonged hospital stay. In surgical patients, factors such as age, alcohol abuse, low baseline cognition, severe metabolic imbalance, hypoxia, hypotension, and type of surgery appear to contribute to postoperative delirium. Anesthetics, notably anticholinergic drugs and benzodiazepines increase the risk for delirium.

Also, delirium is a common postoperative problem in the old adults often caused by multiple factors. It is an acute neuropsychiatric disorder manifested with fluctuating disturbances in attention, awareness, and cognition and can be divided into three different subtypes; hyperactive, hypoactive, or mixed. The hypoactive form, present in over 40% of delirium cases, is estimated to be recognized in 20–50% of cases and is often under-diagnosed.

Additionally, postoperative delirium occurs in 17–61% of the major surgical procedures. It may be associated with cognitive decline, prolonged LOS, decreased functional independence and increased risk of dementia, caregiver burden, health care costs, morbidity and mortality. Therefore, delirium is a possibly disastrous condition and is both a huge burden on a patient's health and on the health care system in general.

Older adults are vulnerable due to multiple predisposing risk factors. These risk factors together with provoking triggers, make patients susceptible to developing delirium. Previous studies on delirium pointed out old age, cognitive or functional impairment, number of comorbidities, history of falls, and sensory deprivation as important predisposing factors. Important precipitating factors are polypharmacy, malnutrition, pain, the use of urinary catheters, ICU admission, length of hospital stay (LOS), blood loss, preoperative anemia and type of surgery.

After an initial episode of delirium, post-episode treatment or intervention has little effect on severity, duration, or likelihood of recurrence. However, before its onset, delirium can be preventable in 30–40% of cases, which emphasizes the importance of attention for primary prevention. This can be achieved by interventions tackling risk factors, such as adequate pain management, hearing or visual

aid, sleep enhancement, exercise training, or dietary advice. Several preoperative, perioperative, and postoperative unimodal and multimodal, pharmacological and non pharmacological approaches have been tested, trying to alter various components most likely to provoke a delirium.

Finally, postoperative delirium in the elderly is poorly understood. Indeed, further studies are needed to determine the risk and side effects of delirium in the elderly population. Research is also needed to define the effects of hypoxemia on cerebral function and whether oxygen therapy has any benefits. The geriatric-anesthesiologic intervention program of pre- and postoperative geriatric assessment, early surgery, thrombosis prophylaxis, oxygen therapy, prevention and treatment of perioperative decrease in blood pressure and successful treatment of any postoperative complications showed some promise, but further definitive studies are recommended.

6.Recommendations

- further studies are needed to determine the risk and side effects of delirium in the elderly population.
- Research is also needed to define the effects of hypoxemia on cerebral function and whether oxygen therapy has any benefits.
- The geriatric-anesthesiologic intervention program of pre- and postoperative geriatric assessment, early surgery, thrombosis prophylaxis, oxygen therapy, prevention and treatment of perioperative decrease in blood pressure and successful treatment of any postoperative complications showed some promise, but further definitive studies are recommended.

7.References

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