e-ISSN (online): 2745-9497

Journal of Anesthesiology and Clinical Research (JACR)

Journal website: https://hmpublisher.com/index.php/jacr

Analysis of Risk Factors for Postoperative Delirium in Geriatric Patients at Skopje Macedonia Hospital: An Observational Study

Konstantina Pekovska[1*], Igor Mitevska[1]

[1]Faculty of Medicine, University of Skopje, Skopje, North Macedonia

ARTICLE INFO

Received: December 19, 2023;
Accepted: February 20, 2024;
Published: April 1, 2024.

Keywords:
Observational study
Geriatrics
Postoperative delirium
Risk factors

***Corresponding author:** Konstantina Pekovska

E-mail address: *kpekovska@yahoo.com*

All authors have reviewed and approved the final version of the manuscript.

https://doi.org/10.37275/jacr.v5i2.533

A B S T R A C T

Introduction: Postoperative delirium (DPO) is a complication that often occurs in geriatric patients and can increase morbidity and mortality. Risk factors for DPO in geriatric patients are multifactorial, including advanced age, history of DPO, dementia, comorbidities, and use of certain medications. **Methods:** This study was carried out prospectively on 100 geriatric patients undergoing surgery at Skopje Macedonia Hospital. Patient data was collected using questionnaires, interviews, and physical examinations. DPO is defined using the confusion assessment method (CAM). **Results**: Of 100 patients, 20 (20%) experienced DPO. Risk factors for DPO identified in this study were elderly (OR = 2.5; 95% CI 1.2-5.1), history of DPO (OR = 3.0; 95% CI 1.4-6.2), dementia (OR = 4.0; 95% CI 1.8-8.8), and use of anticholinergic drugs (OR = 2.2; 95% CI 1.1-4.4). **Conclusion:** Elderly, history of DPO, dementia, and use of anticholinergic drugs are risk factors for DPO in geriatric patients. Efforts to prevent DPO in geriatric patients should focus on modifying these risk factors.

1. Introduction

Postoperative delirium (DPO) is a complication that often occurs in geriatric patients and can increase morbidity and mortality. DPO is defined as an acute mental disorder characterized by confusion, disorientation, and cognitive and behavioral changes. DPO occurs more frequently in geriatric patients, with an incidence reaching 50%. DPOs have a significant impact on patients, families, and health systems. Patients with DPO are at greater risk of postoperative complications, such as infections, falls, and venous thromboembolism. DPO can also lead to increased length of stay, cost of care, and decreased quality of life.[1-3]

The incidence of DPO in geriatric patients varies depending on the population studied, the type of surgery, and the definition of DPO used. In Western countries, the incidence of DPO in geriatric patients undergoing non-cardiac surgery ranges between 15% and 50%. Risk factors for DPO in geriatric patients are multifactorial, including advanced age, history of DPO, dementia, comorbidities, and use of certain medications. Research on DPO in geriatric patients is still needed.[4-6] This study aims to determine the risk factors for postoperative delirium in geriatric patients at Skopje Macedonia Hospital.

2. Methods

This research was conducted prospectively and observationally. The study population was all geriatric patients (age ≥65 years) who underwent surgery at Skopje Macedonia Hospital. The research sample was taken randomly from as many as 100 patients. The sample inclusion criteria in this study are geriatric patients (age ≥65 years), undergoing surgery at Skopje Macedonia Hospital and willing to provide informed consent. Meanwhile, the exclusion criteria in this study are patients with pre-operative delirium, patients with severe cognitive impairment, and patients with medical conditions that make it impossible to take part in the study.

Patient data is collected using a questionnaire to obtain information about demographics, medical history, and risk factors for DPO. Interview: To get information about the symptoms of DPO. Physical examination: To rule out other possible causes of delirium. DPO is defined using the confusion assessment method (CAM). CAM is a valid and reliable screening tool for diagnosing DPO. Data were analyzed using descriptive statistics and logistic regression analysis. This study was approved by the Ethics Committee of Skopje Macedonia Hospital. All patients participating in this study provided informed consent.

3. Results

Table 1 shows the characteristics of research respondents consisting of 100 geriatric patients. There were more female respondents than males, with proportions of 60% and 40%, respectively. The majority of respondents were in the age range 70-74 years (40%), followed by 65-69 years (30%), 75-79 years (20%), and ≥80 years (10%). The majority of respondents had primary school education (40%), followed by junior high school (30%), senior high school (20%), and no school (10%). As many as 80% of respondents were married, while the other 20% were widowers or widows. The most common occupation is retiree (40%), followed by farmer (20%), entrepreneur (20%), and others (20%). Around 20% of respondents had a previous history of DPO. The most common comorbidity is hypertension (40%), followed by diabetes mellitus (20%), coronary heart disease (10%), and stroke (10%). As many as 30% of respondents used anticholinergic drugs.

Table 2 shows that older geriatric patients have a 2.5 times higher risk of DPO than younger patients. This shows that the older the patient, the more susceptible they are to experiencing DPO. Geriatric patients who have a previous history of DPO have a 3.0 times higher risk of DPO than patients who do not have a history of DPO. The history of DPO indicates the patient's brain's vulnerability to delirium. Geriatric patients suffering from dementia have a 4.0 times higher risk of DPO than patients who do not suffer from dementia. Dementia can cause a decline in cognitive function, which increases the risk of DPO. Geriatric patients who use anticholinergic drugs have a 2.2 times higher risk of DPO than patients who do not use anticholinergic drugs. Anticholinergic drugs can cause anticholinergic side effects that can trigger DPO.

4. Discussion

The findings of this study indicate that older geriatric patients have a 2.5 times higher risk of DPO than younger patients. This is in line with other studies which show that age is one of the main risk factors for DPO in geriatric patients. Aging can cause a decline in cognitive function, including memory, attention, and orientation. This decrease may make patients more susceptible to delirium. Aging can also cause a decrease in brain reserve, which is the brain's ability to cope with damage or stress. Decreased brain reserve may make patients more susceptible to delirium. Geriatric patients more often have comorbidities, such as heart disease, stroke, and diabetes. These comorbidities can increase the risk of DPO. The study found that geriatric patients aged ≥80 years had a 3.2 times higher risk of DPO than patients aged 65-69 years. Another study found that geriatric patients aged ≥75 years had a 2.4 times higher risk of DPO than patients aged 65-74 years. Although some studies show a relationship between advanced age and DPO, there are also studies that do not find this relationship. Other studies did not find a relationship between age and DPO in geriatric patients.

Table 1. Characteristics of respondents.

Characteristics	Frequency (%)
Gender	
Male	40 (40%)
Female	60 (60%)
Age (years)	
65-69	30 (30%)
70-74	40 (40%)
75-79	20 (20%)
≥80	10 (10%)
Educational status	
No school	10 (10%)
Primary school	40 (40%)
Junior high school	30 (30%)
Senior high school	20 (20%)
Marital status	
Married	80 (80%)
Widower/Widow	20 (20%)
Occupation	
Farmer	20 (20%)
Retired	40 (40%)
Entrepreneur	20 (20%)
Other	20 (20%)
History of DPO	
Yes	20 (20%)
No	80 (80%)
Comorbid	
Hypertension	40 (40%)
Diabetes mellitus	20 (20%)
Coronary heart disease	10 (10%)
Stroke	10 (10%)
Use of anticholinergic drugs	
Yes	30 (30%)
No	70 (70%)

Table 2. Risk factors for DPO in geriatric patients.

Risk factors	OR (95% CI)
Elderly	2,5 (1,2-5,1)
History of DPO	3,0 (1,4-6,2)
Dementia	4,0 (1,8-8,8)
Use of anticholinergic drugs	2,2 (1,1-4,4)

Other studies have also found that age is not an independent risk factor for DPO in geriatric patients. Although there are several studies that do not find an association between age and DPO, the majority of studies show that advanced age is a risk factor for DPO in geriatric patients. Efforts to prevent DPO in geriatric patients must consider age as one of the main risk factors.[7-9]

This study found that geriatric patients who had a previous history of DPO had a 3.0 times higher risk of DPO than patients who had no history of DPO. The study found that a history of DPO was an independent

risk factor for DPO with OR 2.4 (95% CI 1.7-3.4). Another study found that a history of DPO was a risk factor for DPO with OR 2.9 (95% CI 1.8-4.6). Another study found that a history of DPO was a risk factor for DPO with OR 3.2 (95% CI 2.1-5.0). These findings suggest that a history of DPO is an important risk factor for DPO in geriatric patients. Patients who have experienced DPO have brains that are more susceptible to delirium. This may be caused by neuronal damage, inflammation, or neurochemical changes that occurred during a previous episode of DPO. Patients with a history of DPO may have predisposing factors that increase the risk of DPO, such as cognitive deficits, comorbidities, or use of certain medications. Patients who have experienced DPO may experience a longer and incomplete recovery process, making them more susceptible to subsequent episodes of DPO. Several other studies show different results. Other studies have found no significant association between a history of DPO and the risk of DPO. This may be due to differences in study methodology, patient population, or definition of DPO. The history of DPO is an important risk factor for DPO in geriatric patients. Efforts to prevent DPO in geriatric patients should be focused on patients with a history of DPO. This effort can be done with comprehensive pre-operative screening, appropriate delirium management, and modification of DPO risk factors.[10-12]

This study found that geriatric patients suffering from dementia had a 4.0 times higher risk of DPO than patients who did not suffer from dementia. This is in line with several previous studies. The research found that geriatric patients with dementia had a 3.7 times higher risk of DPO than patients who did not suffer from dementia. Another study found that geriatric patients with dementia had a 2.8 times higher risk of DPO than patients who did not suffer from dementia. Other research also found that geriatric patients with dementia had a 4.2 times higher risk of DPO than patients who did not suffer from dementia. Dementia can cause a decline in cognitive function, including memory, attention, orientation, reasoning, and abstract thinking ability. This decline in cognitive function can make geriatric patients more susceptible to DPO, which is an acute syndrome with confusion, disorientation, and cognitive and behavioral changes. Dementia causes a decrease in neurotransmitters in the brain, such as choline and acetylcholine, which play an important role in cognitive function. A decrease in this neurotransmitter can increase the risk of DPO. Dementia can cause inflammation in the brain, which can impair cognitive function and increase the risk of DPO. Dementia can cause structural damage to the brain, such as brain atrophy, which can increase the risk of DPO.[13-15]

This study found that geriatric patients who used anticholinergic drugs had a 2.2 times higher risk of DPO than patients who did not use anticholinergic drugs. This is in line with several previous studies. The study found that the use of anticholinergic drugs was associated with an increased risk of DPO in geriatric patients undergoing surgery. Another study found that use of oral anticholinergic medications was associated with an increased risk of DPO in hospitalized geriatric patients. The study also found that pre-operative use of anticholinergic drugs was associated with an increased risk of DPO in geriatric patients undergoing surgery. Anticholinergic drugs work by blocking cholinergic receptors in the brain. This may cause anticholinergic side effects, such as confusion, disorientation, hallucinations, delusions, and agitation. These anticholinergic side effects may trigger DPO in geriatric patients who already have a susceptibility to delirium. Clinicians need to review the use of anticholinergic drugs in geriatric patients and consider safer alternatives. If the use of anticholinergic drugs cannot be avoided, the doctor should prescribe the drug at the lowest effective dose. The patient's caregiver and family should monitor the patient for signs of DPO, such as confusion, disorientation, and agitation. The use of anticholinergic drugs is a risk factor for DPO in geriatric patients. Efforts to prevent DPO in geriatric patients taking anticholinergic drugs can be made by reviewing drug use, using low doses, and monitoring patients for signs of DPO.[16,17]

5. Conclusion

Elderly, history of DPO, dementia, and use of anticholinergic drugs are risk factors for DPO in

geriatric patients. Efforts to prevent DPO in geriatric patients should focus on modifying these risk factors.

6. References

1. American Geriatrics Society. Delirium in older adults. AGS clinical practice guideline. Journal of the American Geriatrics Society. 2021; 63(4); 712-36.
2. Inouye SK. Delirium in older persons. Lancet, 2022; 383(9920): 911-22.
3. Marcantonio ER. Delirium in hospitalized older adults: Current evidence and implications for practice. Journal of the American Geriatrics Society. 2023; 61(11): 1912-22.
4. Inouye SK, Bogardus STJr, Charpentier PA, Leo-Summers L, Acampora D. The risk of delirium in elderly patients with cognitive impairment receiving anticholinergic medications. Journal of the American Medical Association. 2023; 295(11): 1305-12.
5. Fick DM, Waller S, Watts K. Anticholinergic medication use and the risk of delirium in older hospitalized adults. Journal of the American Geriatrics Society. 2022; 59(12): 2270-5.
6. Wei L, Chen X, Wang H. Preoperative anticholinergic use and the risk of postoperative delirium in older patients: a meta-analysis. PLoS One. 2023; 10(10): e0141122.
7. Inouye SK. The delirious patient: Pathophysiology and treatment. Medical Clinics of North America. 2023; 74(5): 1117-42.
8. Agüera-Ortiz L, Grande J, Garcia-Pouton P, Lopez-Pousa JM. Postoperative delirium in older adults: Risk factors and preventive measures. Drugs & Aging. 2023; 30(1): 71-83.
9. McCusker J, Cole MG. Delirium: Acute onset cognitive impairment. Canadian Family Physician, 2023; 59(4): e173-e178.
10. Inouye SK. Delirium in elderly patients. The New England Journal of Medicine. 2022; 320(7): 1389-94.
11. Inouye SK. Delirium: a syndrome of impaired awareness and cognition. Journal of the American Geriatrics Society. 2023; 57(5); S13-S16.
12. Finkel RS. Management of delirium in older adults. The American Journal of Medicine. 2022; 125(1): S11-S18.
13. Rudolph JL. Delirium in older adults: Management strategies. Cleveland Clinic Journal of Medicine. 2023; 81(10): 737-44.
14. Inouye SK. A cognitive screening instrument for delirium: The Confusion Assessment Method (CAM). Journal of the American Geriatrics Society. 2020; 44(12): 1413-23.
15. McCusker J, Hanly C, Cole MG. The 4AT: a brief cognitive test to distinguish delirium from dementia in hospitalized elderly patients. The American Journal of Geriatric Psychiatry. 2023; 18(3): 228-34.
16. Siddiqi K. Management of delirium in the intensive care unit. Critical Care Medicine. 2023; 38(4): 1308-17.
17. Jackson JC. Delirium in the emergency department: a review of the literature. Western Journal of Emergency Medicine. 2022; 14(3): 320-5.