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Incidence and risk factors of postoperative delirium in older adults undergoing hip surgery: A prospective observational study.

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ABSTRACT

Background:

Postoperative delirium is a frequent neuropsychiatric complication following hip surgery in older adults and is associated with prolonged hospitalization, increased morbidity, and mortality.

Objective:

To determine the incidence and preoperative risk factors of postoperative delirium following hip surgery.

Methods:

This prospective observational study included 87 adult patients undergoing hip surgery at a tertiary care center between January 2020 and December 2023. Preoperative demographic characteristics, comorbidities, neurological and psychiatric history, hemoglobin levels, and functional status were recorded. Postoperative delirium was diagnosed using ICD-10 criteria. Statistical analysis included chi-square test, independent t-test, and logistic regression analysis.

Results:

Nineteen out of 87 patients developed postoperative delirium, giving an incidence of 21.8 cases per 100 patients undergoing hip surgery. Advanced age (>70 years), male sex, dementia, Parkinson's disease, psychiatric illness, and poor functional status were significantly associated with delirium ($p < 0.001$). Mean hospital stay was longer in the delirium group (15±2 days) compared to the non-delirium group (9±2 days; $p<0.001$).

Conclusion:

Postoperative delirium is common after hip surgery and is strongly associated with preexisting neurological disease and functional dependence.

Keywords: *Functional dependence, cognitive impairment, parkinson's disease*
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BACKGROUND

Postoperative delirium is a common complication among older adults undergoing major surgery, particularly hip surgery. It is characterized by an acute onset of fluctuating consciousness, inattention, and cognitive dysfunction. Delirium is associated with increased hospital stay, healthcare costs, morbidity, and mortality. Several predisposing factors, such as advanced age, preexisting neurological disease, functional dependence, and psychiatric illness, contribute to its occurrence.

Despite its clinical significance, data on incidence and

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risk factors of postoperative delirium in the Indian population remain limited. Understanding the risk factors may help in early identification and preventive strategies.

Objective: To assess the incidence of postoperative delirium in patients undergoing hip surgery and to identify preoperative risk factors associated with its occurrence.

MATERIALS AND METHODS

Study Design

Prospective observational study.

Setting

The study was conducted at Kalinga Institute of Medical Sciences, Bhubaneswar, India, between January 2020 and December 2023.

Participants

Eighty-seven adult patients (>18 years) undergoing hip surgery were enrolled. Patients with pre-existing severe cognitive impairment preventing assessment were excluded.

Variables

The primary outcome was postoperative delirium. Predictor variables included age, sex, comorbidities, neurological disorders, psychiatric illness, anemia, and functional status.

Data Sources/Measurement

Demographic variables, comorbidities, neurological disorders, psychiatric illness, functional status assessed using activities of daily living (ADL), and hemoglobin levels were documented preoperatively. Postoperative delirium was diagnosed using ICD-10 criteria.

Bias

Standard diagnostic criteria and uniform assessment methods were used to reduce measurement bias.

Study Size

The study included all eligible patients undergoing hip surgery during the study period.

Statistical Methods

Categorical variables were analyzed using the chi-square test. Continuous variables were compared using an independent t-test. Odds ratios with 95% confidence intervals were calculated. A p-value <0.05 was considered statistically significant.

Ethical Consideration

The study was approved by the Institutional Ethics Committee of Kalinga Institute of Medical Sciences, Bhubaneswar (2019).

OBSERVATIONS AND RESULTS

Total number of cases assessed for eligibility (n=102)
out of them, Excluded (n=10) due to not meeting criteria (n=7), and declined (n=8)
Included in final analysis (n=87)
Developed delirium (n=19)
No delirium (n=68)
Nineteen patients developed postoperative delirium, giving an incidence of 21.8 cases per 100 patients. Fourteen patients (73.7%) were aged above 70 years, and 15 (78.9%) were male. Hypermotor delirium was the most common subtype (89.5%). Mean hospital stay was significantly longer in the delirium group (15±2 days) compared to the non-delirium group (9±2 days). In-hospital mortality among delirium patients was 21.1%.

Table 1. Preoperative Risk Factors for Postoperative Delirium

Risk Factor	Delirium (n=19)	Non-Delirium (n=68)	Odds Ratio
Parkinson's disease	10 (52.6%)	4 (5.9%)	17.4
Dementia	15 (78.9%)	10 (14.7%)	25.0
Psychiatric illness	9 (47.4%)	2 (2.9%)	31.0
ADL <2	10 (52.6%)	1 (1.5%)	92.0
Anemia	16 (84.2%)	61 (89.7%)	0.7

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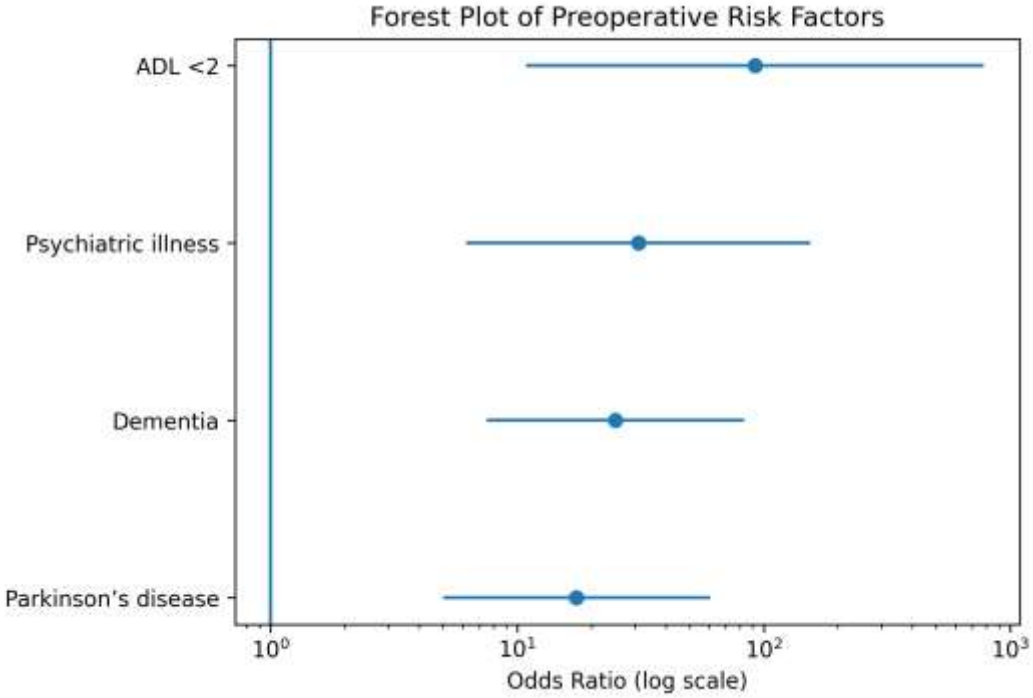
Table 2. Reversible Causes of Delirium

Cause	Number (n=19)	Percentage
Urosepsis	8	42.1%
Hyponatremia	4	21.1%
Other infections	3	15.8%
No cause identified	7	36.8%

Figure 1. Forest Plot of Preoperative Risk Factors



Forest plot showing odds ratios with 95% confidence intervals for significant preoperative risk factors associated with postoperative delirium.

DISCUSSION

The incidence of postoperative delirium in the present study was 21.8%, which is comparable to rates reported in previous studies following hip surgery.[1] Advanced age and male sex were common demographic characteristics among patients who developed delirium. Pre-existing dementia and Parkinson's disease emerged as strong predictors of postoperative delirium, supporting the concept of reduced cognitive reserve.[2,3] Functional dependence (ADL <2) showed the highest odds ratio, highlighting frailty as a major predisposing factor.[4]

Hypermotor delirium was the predominant subtype observed, likely due to easier clinical recognition in postoperative settings. The observed in-hospital mortality underscores delirium as a marker of poor prognosis. [5]

CONCLUSION

Postoperative delirium is a frequent and serious complication following hip surgery in older adults. Pre-existing neurological disorders, psychiatric illness, and functional dependence are strong predictors. Routine

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preoperative risk stratification may reduce postoperative morbidity and mortality.

LIMITATIONS

Single-center design and modest sample size may limit generalizability.

RECOMMENDATIONS

Routine preoperative cognitive and functional screening is recommended for older adults undergoing hip surgery.

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LIST OF ABBREVIATIONS

ADL – Activities of Daily Living
ICD – International Classification of Diseases

SOURCE OF FUNDING

None.

DATA AVAILABILITY

Data available on reasonable request.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

All authors contributed to the study design, data collection, analysis, and manuscript preparation.

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