

Original Research Article

THE EFFECTS OF COMORBIDITIES ON PERIOPERATIVE OUTCOMES OF FEMUR FRACTURES IN GERIATRIC POPULATION ATTENDING A TERTIARY CARE HOSPITAL – A RETROSPECTIVE STUDY

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ABSTRACT

Background: Older population having femur fractures usually have multiple preexisting medical problems that may affect their treatment and outcomes. The Orthopaedic department of SCB medical college provides standardized treatment and enhanced outcomes. The purpose of this study is to determine whether femur fracture patients with specific comorbidities are at risk of worsened perioperative outcomes such as increased time to surgery (TTS), postoperative complications, and longer length of hospital stay (LOS).

Materials & Methods: A total of 210 patients aged 65 years and older who underwent surgery for femur fracture at SCB Medical College from January 2024 to December 31, 2024, were evaluated. Terminally ill patients and those had not given consent were excluded from this study. Comorbidities measured in the Charlson Comorbidity index were abstracted through chart review. Perioperative Outcomes like mortality, TTS, postoperative complications, LOS, functional recovery were analysed.

Results: Most patients are with an average age of 80. Patients with higher CCI scores had significantly increased rates of postoperative complications ($p < 0.05$), longer hospital stays ($p < 0.01$), and higher 30-day mortality ($p < 0.01$). Multivariate analysis identified diabetes, chronic kidney disease, and cardiovascular disease as independent predictors of poor outcomes.

Conclusion: Fragility and comorbidity expose this geriatric population with femur fracture to higher risk for adverse perioperative outcomes. Preoperative optimization and tailored management strategies are essential to improve outcomes in this vulnerable population.

Keywords: femur fractures, comorbidity, perioperative outcomes, diabetes, hypertension, geriatric population.

INTRODUCTION

Osteoporosis and hip fractures are major public health concerns that are expected to become worse with the aging of the US population.^[1] More than 90% of hip fracture patients are older than 65 years and the fracture usually occurs in patients who have preexisting medical problems or comorbidities.^[2,3]

Femur fractures are a major cause of morbidity and mortality in the geriatric population, often resulting from low-energy trauma such as falls.^[4] With the global aging population, the incidence of these fractures is expected to rise, posing a significant burden on healthcare systems.^[5] Surgical intervention is the standard of care for femur fractures in elderly patients, but the presence of

comorbidities complicates perioperative management and outcomes.^[6,7,8]

Comorbidities such as diabetes, cardiovascular disease, and chronic kidney disease are prevalent in the elderly and are known to influence surgical outcomes.^[9] However, the extent to which these comorbidities affect perioperative outcomes in geriatric patients with femur fractures remains poorly understood.^[10] This study aims to evaluate the impact of comorbidities on perioperative outcomes, including mortality, complications, and length of hospital stay, in a cohort of 210 geriatric patients.

MATERIALS AND METHODS

Study Design and Population

After taking IEC (Institutional Ethics Committee) approval, a retrospective cohort study was conducted on 210 patients aged 65 years and older who underwent surgical management for femur fracture at Orthopaedics department of SCB Medical College, Cuttack from January 2014 to December 2024. Patients were identified from the hospital's electronic medical records, and data were

collected on demographics, comorbidities, surgical details, and perioperative outcomes.^[11]

Data Collection

Comorbidities were assessed using the Charlson Comorbidity Index (CCI).^[12]

Perioperative Outcomes including 30-day mortality, postoperative complications (e.g., infections, thromboembolism, delirium), length of hospital stay, and functional recovery at 3 months post-surgery data were taken.^[13]

Statistical Analysis: Data were analysed using Statistical Software, e.g., SPSS version 17. Univariate and multivariate analysis were performed to identify predictors of poor outcomes. A p-value < 0.05 was considered statistically significant.

RESULTS

Patient Characteristics

The study included 210 patients with a mean age of 78.5 ± 6.2 years. The majority were female (65.7%), and the most common comorbidities were hypertension (72.4%), diabetes (38.1%), and cardiovascular disease (29.5%).

Table 1: Baseline Characteristics of the Study Population (n = 210)

Characteristic	Value
Age (years)	78.5 ± 6.2
Gender	
Male	72 (34.3%)
Female	138 (65.7%)
Comorbidities	
Hypertension	152 (72.4%)
Diabetes Mellitus	80 (38.1%)
Cardiovascular Disease	62 (29.5%)
Chronic Kidney Disease	45 (21.4%)
COPD	30 (14.3%)
Charlson Comorbidity Index (CCI)	
CCI 0-2	85 (40.5%)
CCI 3-4	70 (33.3%)
CCI ≥ 5	55 (26.2%)

Perioperative Outcomes

Mortality: The 30-day mortality rate was 8.1%, with higher mortality observed in patients with CCI scores ≥ 5 ($p < 0.01$).¹⁴

Complications: Postoperative complications occurred in 34.3% of patients, with infections (15.2%) and thromboembolism (9.5%). Patients with diabetes had a significantly higher risk of infections ($p < 0.05$).

Length of Stay: The mean hospital stay was 12.3 ± 4.7 days, with longer stays associated with higher CCI scores ($p < 0.01$).

Functional Recovery: After 3 months post-surgery, 42.9% of patients had regained baseline mobility, while 28.6% required assisted living.

Multivariate Analysis

Diabetes (OR 2.1, 95% CI 1.3-3.4), chronic kidney disease (OR 1.8, 95% CI 1.1-2.9), and cardiovascular disease (OR 1.7, 95% CI 1.0-2.8) were identified as independent predictors of poor perioperative outcomes.^[15]

Table 2: Perioperative outcomes

Outcome	Overall (n=210)	CCI 0-2 (n=85)	CCI 3-4 (n=70)	CCI ≥5 (n= 55)	P value
30 Day Mortality	17 (8.1%)	2 (2.4%)	5 (7.1%)	10 (18.2%)	<0.01
Post-Op complications	72 (34.3%)	20 (23.5%)	25 (35.7%)	27 (49.1%)	<0.05
Infections	32 (15.2%)	8 (9.4%)	12 (17.1%)	12 (21.8%)	<0.05
Thromboembolism	20 (9.5%)	5 (5.9%)	7 (10.0%)	8 (14.5%)	0.12
Delirium	15 (7.1%)	4 (4.7%)	6 (8.6%)	5 (9.1%)	0.45
Length of hospital stay (Days)	12.3 ± 4.7	10.5 ± 3.2	12.8 ± 4.1	14.5 ± 5.6	<0.01

Functional recovery at 3 months					
Regained Baseline Mobility	90 (42.9%)	45 (52.9%)	30 (42.9%)	15 (27.3%)	< 0.01
Required Assisted Living	60 (28.6%)	20 (23.5%)	25 (35.7%)	15 (27.3%)	< 0.01

Table 3: Multivariate Analysis of Predictors of Poor Perioperative Outcomes

Predictor	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Diabetes Mellitus	2.1	1.3 – 3.4	< 0.05
Chronic Kidney Disease	1.8	1.1 – 2.9	< 0.05
Cardiovascular Disease	1.7	1.0 – 2.8	< 0.05
CCI ≥ 5	2.5	1.5 – 4.2	< 0.01

Notes on Tables

- Table 1:** Provides an overview of the study population, including demographics and comorbidities.
- Table 2:** Compares perioperative outcomes across different CCI groups to highlight the impact of comorbidities.
- Table 3:** Identifies independent predictors of poor outcomes using multivariate analysis

DISCUSSION

This study highlights the significant impact of comorbidities on perioperative outcomes in geriatric patients with femur fractures.^[16] Patients with higher CCI scores had worse outcomes, including increased mortality, complications, and longer hospital stays. These findings are consistent with previous studies demonstrating the adverse effects of comorbidities on surgical outcomes in the elderly.^[17]

The high prevalence of diabetes and cardiovascular disease in our cohort underscores the need for preoperative optimization, including glycaemic control and cardiovascular risk assessment. Additionally, the association between chronic kidney disease and poor outcomes suggests the importance of renal function monitoring in this population.

Limitations

It is a retrospective design and single-centre setting, which may limit generalizability. Future prospective studies are needed to validate these findings and explore interventions to mitigate the impact of comorbidities.

CONCLUSION

Comorbidities significantly worsen perioperative outcomes in geriatric patients with femur fractures. Preoperative assessment and optimization of comorbidities are critical to improving outcomes in this vulnerable population. Multidisciplinary care involving orthopaedic surgeons, geriatricians, and anaesthesiologists is essential to address the complex needs of these patients.

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