Section: Orthopaedics

Case Series

ESTIMATION OF THE RISK FACTORS OF POSTOPERATIVE DELIRIUM AND ASSESSMENT OF ITS SEVERITY IN GERIATRIC POPULATION WITH FRACTURE NECK OF FEMUR IN HILLY REGION OF NORTHERN INDIA: CASE SERIES

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Abstract

About one in five patients admitted to medical wards have delirium, a typical side effect of physical sickness in old age. This percentage is higher for elderly patients with femur fractures. Delirium is a medical emergency that could have major repercussions for the patient and their family if it is not treated quickly and urgently—or, better yet, prevented altogether. Appropriate methods for its prevention and treatment lead to reduced hospital stays, lower costs, better surgical outcomes, and improved rehabilitation for older patients. This case series present the modifiable and non-modifiable risk factors of newly onset delirium after postoperative fracture neck of femur.

INTRODUCTION

For senior patients, fractured neck of femur (NOF) continues to be the second most common reason for hospital admission.[1] A problematic subgroup of patients with a femoral neck fracture includes those who are extremely old and are believed to have more comorbidities, which is linked to worse outcomes. In older patients, postoperative delirium is a common side effect of surgical procedures. It's a complex disorder with variable symptoms that impairs cognition, attention, and consciousness and is linked to unfavorable results. Previous reviews have shown that a significant number of orthopaedic patients are affected by it, despite the fact that patient-related risk factors have a significant impact on its incidence. In comparison to patients receiving elective surgery (3.6–28.3 percent), patients undergoing hip fracture surgery experienced greater rates of delirium (varying from 4 to 53 percent) according to a 2007 meta-analysis of 26 studies.[2] For an orthopaedic patient, delirium has immediate negative effects that include a higher chance of serious complications, a slower rate of recovery, and consequently a longer length of stay in the hospital.[3] Postoperative delirium in patients who have had hip fractures has several complicated and poorly understood causes. It is believed that the physiological strain of surgery combined with a build-up of patient risk factors that predispose them to it is what causes its start. Therefore, determining who is at risk is essential to developing preventative and therapeutic strategies.[4] The aim of this case series was to identify the most prevalent risk factors for delirium with a recent onset. The cases were taken from tertiary care hospital, Uttarakhand in the year 2023-2024. In this series, we have used diagnostic tools for assessment of delirium such as the Confusional Assessment Method (CAM) and to measure its severity we have applied the Confusional Assessment Method -Severity (CAM-S) scales.

Case series 1:

70 years old male with a history of fall at home, presented to EMR with complain of pain and unable to bear weight on right lower limb. He had history of Hypertension with COPD for past 7 years, for which he was regular medication. There was no past history of any psychiatric illness. Body Mass Index: 15.34kg/m2. On further investigations x-ray s/o Fracture neck of femur. His Blood investigations were following Hb-12.8 g/dl, TLC- 8600, ESR-8, Total Calcium level -9.1mg/dl, Sodium- 132mg/dl, Potassium – 4.0mg/dl, Creatinine level 1.0mg/dl and vitals were stable. After PAC workup Pt. was posted for Right sided fixed Bipolar Hemiarthroplasty. Non eventful surgery was done. On 2nd day post replacement day pt. was found to be in acute confusional state where he was not being able to recognize his family members, unable to

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judge the place and timings of the present situation. Started talking irrelevantly and nursing staff reported of his poor sleep schedule. Pt was hyperactive in the way that he self-removed his IV cannula from left forearm, removed his dressing from surgical site and tried removing his foley's catheter. Urgent Psychiatry referral was sought for and certain investigations was advised for his delirious state. As per the lab investigation patients sodium levels had decreased to 124mg/dl, TLC count had increased to 12,837, Hb was reduced to 10.4g/dl. CAM scale was applied and was positive in terms of his fluctuating course of his delirious state when assessed for a couple of 2-3 days, was inattentive when being asked to raise his hand up when letter A was being called out, and had disorganized thinking when being asked the current year. CAM-S score was 14.

Case series 2:

74 years old male with history of fall at home 5 days back presented to EMR with complain of pain at left hip region and unable to walk since injury. Patient was suffering from CKD since last 7 years and was on regular Dialysis, once every week. BMI was 16.34kg/m2. His further investigations were done. X-ray s/o Fracture neck of left hip. Hb-8.6gm/dl, TLC-11,500, ESR-24, Creatinine -2.4, Total Calcium level-7.8, Sodium level-138, Potassium level-3.8 and vitals were stable. General Medicine reference was sought for dialysis and blood transfusion of 2 units. Nephro safe medications were started for mildly raised TLC and ESR levels. There was no past history of any psychiatric illness. His Post dialysis and transfusion reports were Hb-11.2gm/dl, TLC-6,000, Creatinine- 1.2. After getting PAC clearance, fixed Bipolar hemiarthroplasty of left hip was done. 1 unit of PRBC was transfused per op. otherwise the surgery was uneventful. On POD 6, patient started showing agitated behavior and was restless. His sleep wake cycle was also disturbed and had difficulty in initiating and maintaining his pattern of sleep. Psychiatry reference was sought. Patient was started on low dose Inj Haloperidol given intra muscularly as a stat dose and when required on sos basis. Blood investigations were again repeated. His Hb level 9.4gm/dl, Sodium levels 126 mg/dl, Potassium level was 2.9 mg/dl. Patient was disoriented in terms of time, place and person. Patient started with irrelevant talking and muttering to self. Patient was assessed again by the Psychiatrist. He was started on Tab Olanzapine 2.5mg at bedtime for his visual hallucinations. CAM was accessed and was found to be positive. CAM-S score was 13.

Case Series 3:

82 years old female came to EMR with history of fall at home with complain of severe pain over right hip and unable to sit or walk since 1 day. She had history of Hypertension since 12 years and had undergone CABG surgery 10 years back and was on regular medication. BMI was 18.27kg/m2. After admission, further investigations were done. X-rays s/o Fracture Neck of right femur. Her Blood reports were following Hb-10.2gm/dl, ESR-12, Total Calcium 9.1, Sodium Level- 136, Potassium level-3.8, Mildly Raised PT-INR levels. After Getting Clerance from Anesthesia side and cardio side. Antiplatelet drug was stopped day before surgery. Cemented Fixed Bipolar hemiarthroplasty was done, surgery was uneventful. Cardiac medications were started from POD 2. Pt.'s physiotherapy was started from day 2 like sitting, Knee ROM exercises.

On POD 4 Pt. started having minimal sleep. Her sleep onset was disturbed couldn't maintain her sleep all throughout the night. Gradually she started having agitated and irritable mood and would not consume food considering it to be poisoned. Patient was seemed to be disoriented. Urgent psychiatry reference and opinion was sought. Patient had a fluctuating course of illness as symptoms worsened during evening hours. She also had altered sensorium. Blood investigations were sent and were as following Hb-9.2gm/dl, serum sodium – 124mg/dl, potassium levels-3.2, TLC count was mildly raised. Patient had 2 episodes of spikes of increased body temperature but was stable and was afebrile after giving tablet Zerodol when required. MCV and MCHC had decreased 70fl and 25g/dl respectively. CAM was assessed and was positive regularly for another 1 week. CAM –S score was 13.

Case Series 4:

80 years old female pt. with history of fall at home came to EMR with complain of intense pain over right hip region and unable to walk since 1 days. Pt. had history of Pulmonary Tuberculosis 20 years back for which she had completed the ATT course. Pt. had undergone hysterectomy 35 years back. Patient had chronic knee and back pain for which she regularly took some analgesic medication advised by local practitioner nearby her home. Pt. was non diabetic, non-hypertensive. BMI was 18.68kg/m2. Patient was admitted and further investigation were ordered. Her X-ray s/o Fracture Neck of right hip. Her blood reports are as follows Hb.-9.1gm/dl, ESR-10, Calcium level-8.3mg/dl, Sodium level-140, Potassium level- 4.0, Creatinine level-1.2. After getting anesthesia clearance Pt. was posted for surgery with 2 units of Prbc for transfusion. Cemented Bipolar Hemiarthroplasty was done. Surgery was uneventful. Inj Zoledronic acid was given post operatively for osteoporosis management. Pt. was mobilized for day 3 with high sitting and knee ROM exercise. On POD 7 patient started behaving in appropriately with forgetfulness and confused state. She had shouting spells with anger outbursts and aggressive behavior. She also removed her intravenous set from her left forearm and was in a hyper agitated state. Her sleep pattern was also deteriorated. Her psychomotor activity was markedly increased and had to physically restrained after taking consent from family members. CAM was positive. Psychiatry opinion was taken and tab Haloperidol 0.5mg twice daily was given. Repeated blood investigations were sent and were as

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following Hb- 7.2g/dl, ESR-12, seum vitamin D levels-,
Serum sodium- 127mg/dl, serum potassium – 2.6mg/dl. Patient vitals were as following; Pulse rate: 88bpm, BP: 140/94mmHg, body temperature was afebrile. CAM –S score was 12

Table 1: Assessment of severity of Post operative delirium by CAM-S method case 1

Features	Not `Present / Absent	Present (Mild)	Present (Marked)
Acute onset and fluctuating course			2
Inattention		1	
Disorganised thinking			2
Altered levels of consciousness		1	
Disorientation			2
Memory Impairment			2
Perceptual Disturbances	0		
Psychomotor Agitation			2
Psychomotor Retardation	0		
Altered sleep wake cycle			2

Table 2: Assessment of severity of Post operative delirium by CAM-S method case 2

Features	Not `Present / Absent	Present (Mild)	Present (Marked)
Acute onset and fluctuating course			2
Inattention		1	
Disorganised thinking			2
Altered levels of consciousness	0		
Disorientation			2
Memory Impairment	0		
Perceptual Disturbances			2
Psychomotor Agitation			2
Psychomotor Retardation	0		
Altered sleep wake cycle			2

Table 3: Assessment of severity of Post operative delirium by CAM-S method case 3

Features	Not `Present / Absent	Present (Mild)	Present (Marked)
Acute onset and fluctuating course			2
Inattention		1	
Disorganised thinking			2
Altered levels of consciousness		1	
Disorientation			2
Memory Impairment		1	
Perceptual Disturbances	0		
Psychomotor Agitation			2
Psychomotor Retardation	0		
Altered sleep wake cycle			2

Table 4: Assessment of severity of Post operative delirium by CAM-S method case4

Features	Not `Present / Absent	Present (Mild)	Present (Marked)
Acute onset and fluctuating course			2
Inattention		1	
Disorganised thinking	0		
Altered levels of consciousness			2
Disorientation			2
Memory Impairment		1	
Perceptual Disturbances	0		
Psychomotor Agitation			2
Psychomotor Retardation	0		
Altered sleep wake cycle			2

DISCUSSION

Elderly hip fractures are closely linked to a high incidence of delirium, according to several earlier research.[5] Previous investigations have reported varying incidences of postoperative delirium in older individuals, ranging from 15% to 56%.[6] The aging population is a serious public health concern when it comes to fractures of the neck and femur. Patients over 65 account for the majority of fracture cases, and those with preexisting medical conditions, reliance, and frailty are particularly common. These factors make it an excellent clinical model for researching and comprehending delirium.
The only occurrence (or new onset) delirium that happened during the postoperative phase was the subject of this investigation.
Acute brain dysfunction following surgery, known as postoperative delirium, is brought on by the brain's maladaptation to the stress of the surgical

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procedure. As the population ages, so does the frequency and clinical significance of postoperative delirium following hip fracture surgery.[7] Older individuals undergoing hip fracture surgery have elevated rates of morbidity and mortality when they have postoperative delirium. Several studies have identified risk factors for postoperative delirium, including advanced age, pre-existing cognitive impairment, and co-occurring medical conditions. In addition, it raises the cost of medical care and the in-hospital mortality rate, prolongs hospital stays, and delays postoperative cognitive and functional recovery clinically significant for reducing related morbidity and death, early identification of a high-risk group for postoperative delirium in elderly individuals.[8]

In patients with NOF fractures, we found that a number of independent risk variables, including advancing age, post-operative anemia, and acute electrolyte imbalance, low BMI are associated with the onset of post-operative delirium. In all the above cases patients were in a hyperactive delirium. Preventive measures to reduce the incidence of delirium following surgery may be made possible by identifying patients who are more likely to experience it. CAM was used as a tool for assessment of delirium and

CAM-S mentions the severity of delirium. It is a quicker form of assessment of delirium at bedside treatment for it can be initiated early.

Acute brain dysfunction following surgery, known as postoperative delirium, is brought on by the brain's maladaptation to the stress of the surgical procedure. As the population ages, so does the frequency and clinical significance of postoperative delirium following hip fracture surgery. Older individuals undergoing hip fracture surgery have elevated rates of morbidity and mortality when they have postoperative delirium. Several studies have identified risk factors for postoperative delirium, including advanced age, pre-existing cognitive impairment, and co-occurring medical conditions. In addition, it raises the cost of medical care and the in-hospital mortality rate, prolongs hospital stays, and delays postoperative cognitive and functional recovery clinically significant for reducing related morbidity and death, early identification of a high-risk group for postoperative delirium in elderly individuals.[9]

CONCLUSION

The fracture neck of femur is common in geriatric population. After prolonged hospitalization these patients may go into confusional state which impairs their cognition, attention and consciousness generally termed as delirium. A lot of identifiable risk factors have been established which are changes in the electrolyte balance such as hyponatremia, hypokalemia. Some of the risk factors are reversible and some are irreversible.

Conflict of Interest: None

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