Research Article

A Record-based Analysis of Profile, Pattern and Outcomes of Geriatric Fractures in a Tertiary Care Hospital, Chandigarh

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A B S T R A C T

Introduction: Older people with diseased conditions are more prone to fracture irrespective of gender. Osteoporosis is the most common cause of elderly fractures.

Objectives: 1) To ascertain the profile and pattern of geriatric fracture cases reporting a tertiary care institution, 2) To ascertain the extent of mortality and complications in geriatric fracture cases, and 3) To ascertain the functional outcomes of geriatric fracture cases discharged from the tertiary care institute.

Methodology: A list of geriatric fracture inpatients of an institution was made for 2014 - 2018. The data on the profile of patients, type of fracture, treatment received, the lag time between the reporting and the surgery, comorbidities, past medical history, cause/ place of fracture, length of stay, and status at the time of the phone-based interview were analysed through SPSS software.

Results: The highest range of the age for fracture occurrence was 60-70 years. Female patients were more than the male ones. Femur fracture was the most common. The most common direct cause of the fracture was fall (indoor). Open reduction, internal fixation and arthroplasty were the commonest treatment performed. The lag time between the patient arrival to the health care and surgery was 0-5 days. The highest length of stay by the patients in the hospital was 0-10 days.

Conclusion: The possible direct causes of the fracture reported in the study were falls, roadside accidents, trauma etc.

Keywords: Elderly Care, Geriatric Friendly Environment, Fracture, Fall, Geriatric Fracture

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Introduction

As the second populous inhabited country in the world, India is facing a rise in geriatric morbidities. With an increase in the elderly population, fracture has become an area of major concern because of their vulnerability. Fractures constitute a major source of disability, dysfunction, and reduced quality of life in the elderly, leading to high demand for resources, mainly due to a rise in mortality and dependency. Osteoporosis is the most common cause of hip fracture among the elderly [1-3]. Age, gender, comorbidity, pre-fracture functional status, and fracture type affect the outcome concerning movement, common activities of daily living, and quality of life [4]. The elderly people who sustain hip fractures usually have multiple medical conditions which directly affect their treatment and outcomes [5]. The incidence of geriatric fractures increases with age. With the rise in comorbidities, the problem of fracture among the elderly is becoming more challenging than it was a decade ago [6]. Many of the elderly with fractures report to tertiary care institutions, which can be a major source of information on the type of fracture, complication, treatment modality, and the outcome. Therefore, this study was planned to ascertain the profile and pattern of geriatric fracture cases, to ascertain the extent of mortality and complications in these cases, and to ascertain the functional outcomes of these fracture cases discharged from a tertiary care institute.

Methodology

This study involved data retrieval from records supplemented by phone-based collection of information on the current status of the patients. It was conducted in a tertiary health care institution, the Post-Graduate Institute of Medical Education & Research (PGIMER), Chandigarh. A list of geriatric fracture inpatients was made for 2014 – 2018. The sample size was calculated as 250 (at Alpha = 0.05; Beta = 0.80; P = 0.25; Q = 0.75). A simple random sampling technique was used to select the cases to represent all the years (2014-2018) in both categories (male and female).

For determining the profile/ pattern of the geriatric fracture cases, the data were retrieved and analysed, based on the domains presented at the clinical record data available for the 5 years.

The data collected were stored in an Excel spreadsheet and then it was transferred to SPSS software for analysis to determine hospitalisation, profile of the patient, type of fracture, treatment received, delay in reporting, lag time between the reporting and the surgery, comorbidities associated, past medical history of the patient, immediate cause of fracture, place of fracture, length of stay, mechanism of the fall, present outcomes of the patient, status at the time of the phone-based interview, ADL Scores, and cause of death as recited by the respondent at the time of the phone-based interview.

Inclusion Criterion

Records of geriatric fracture inpatients for 2014 - 2018.

Exclusion Criteria

Those cases whose records were incomplete or those who did not agree for a phone-based interview.

All the study results were kept confidential. Permission was taken from the ethical committee to access the records. Consent of the respondents was taken verbally while doing the phone-based study.

Results

Overall, 250 cases were recruited in the study. Table 1 shows that the frequency of the most common fracture site was femur (60.54%), frequency of indoor fracture was the highest (72%), and the highest frequency for the direct cause of the fracture was fall (81.2%).

Table 1.Details of Fractures

Details of Fractures	Number (%)
Site of fracture	
Femur	155 (60.54)
Humerus/ Shoulder	35 (13.67)
Tibia-Fibula	14 (5.46)
Other sites (hand/ wrist, pelvis-Acetabulum, Spine, Knee Forearm bones, Ankle)	52 (20.33)
Fracture occurrence location	
Indoor	180 (72)
Outdoor	47 (18.8)
Not mentioned	23 (9.2)
Mechanism of fall	
Fall from two-wheeler	15 (7.39)
Fall due to slippage	7 (3.45)
Fall from height	6 (2.96)
Fall from stairs	5 (2.46)
Fall from bed	3 (1.48)
Fall from chair	3 (1.48)
Hit by animal	4 (1.97)
Not mentioned	160 (78.82)
Cause of fracture	
Fall	203 (81.2)
Roadside accident	15 (6)
Trauma	8 (3.2)
Pathologic	1 (0.4)
Not mentioned	23 (9.2)

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Table 2. Treatment-related Details

Treatment-related Details	Number (%)
Delay in reporting (days)	
0-5	93 (37.20)
6-10	22 (8.80)
11-15	14 (5.60)
16-30	17 (6.80)
31& above	27 (10.80)
Not mentioned	77 (30.80)
Time lag between admission and surgery (days)	
0-5	85 (43.37)
6-10	58 (29.59)
11-15	24 (12.24)
16 or above	20 (10.20)
Not mentioned	9 (4.59)
Type of treatment given	
Arthroplasty	68 (22.01)
Amputation	2 (0.65)
Close reduction	37 (11.97)
Open reduction	66 (21.36)
Internal fixation	70 (22.65)
External fixation	3 (0.97)
Conservative	54 (17.48)
Implant removal	9 (2.98)
Length of stay in the hospital (days)	
0-10	102 (40.8)
11-20	91 (36.4)
21-30	28 (11.2)
31 or above	19 (7.6)
Not available	10 (4)

Table 3. Comorbidities present in the Fracture Patients

Comorbidity	Number (%)
Arthritis	4 (1.19)
Alzhimers	1 (0.30)
Cardiovascular disease	76 (22.55)
Asthma	9 (2.67)
Cirrhosis	2 (0.59)
Common peroneal nerve palsy	2 (0.59)
Chronic myeloid leukemia	1 (0.30)
Cervical spondylitis	2 (0.59)
Chronic obstructive pulmonary disease	3 (0.89)
Diabetic neuropathy	1 (0.30)
Diabetes mellitus	87 (25.82)
Essential thrombocythemia	3 (0.89)
Epilepsy	4 (1.19)
Fatty liver	3 (0.89)
Hypertension	121 (35.91)
Thyroid dysfunction	8 (2.37)
Psychiatric illness	4 (1.19)
Scoliosis	1 (0.30)
TB	5 (1.48)

*There were multiple responses.

Table 2, shows that reporting delay was for 10 days or less in 46% of the cases, maximum cases had surgery within 10 days of admission (72.96%), and most cases had a length of stay of 0-20 days (77.2%).

Table 3, represents that hypertension (35.91%), diabetes mellitus (25.82%), and cardiovascular diseases (22.55%) were the comorbidities present in the fracture patients.

IADL score of 11% of the patients had severe to moderate functional impairment and most (88.70%) were fully functional. Gender-wise, among the people who reported for fracture, 139 (55.6%) were female and 111 (44.4%) were male. Age-wise, the maximum cases (54.5%) were represented by the patients of 60-70 years of age.

Discussion

Hip fractures have become a serious cause of health care concern for the elderly population in most countries with increased longevity.[7] The possible direct causes of the fracture reported in the study were falls, roadside accidents, trauma etc. The highest frequency was of fall (81.2%). This was reported in other studies also.[8]

The most common location of fracture was indoors (72%). The outdoor fall accounted for 18.8% of cases in this study. The architectural design of the house and the facilities available inside can be a major risk for elderly falls. Slippery and highly polished stairs, lack of handhold windows and balconies (low or no grills), high racks and cupboards, absence of ramps, slippery bathroom floors, and tripping on rugs in the house can be major risks for indoor falls. Environmental and genetic factors play a role in the aetiology of hip fracture.[9] The various risk factors which contribute to the falls among elderly are environmental hazards, unsafe indoor and outdoor areas, various drug interactions, drowsiness, confusion, heart failure, urinary incontinence, arthritis, cataract, and Parkinson's disease.[10]

The mechanism of the fall mentioned in the study included fall from bed, two-wheelers, chairs, stairs, heights, hit by

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animals, slippage or trauma from road accidents. Roadside accidents and accidental falls are becoming more common due to unsafe roads and outer environments for the elderly, low vision, poor gait, and hearing problems.

Multiple treatment modalities were seen in the study, e.g., arthroplasty (22.01%), open reduction (21.36%), internal fixation (22.65%), external fixation, close reduction, conservative treatment, and implant removal. The frequency of the conservative treatment was as high as 17.48% in this study, e.g., repositioning of the fractured bone by manipulating it through the skin followed by immobilisation of the bone with the help of the cast for several weeks followed by a series of physiotherapy sessions. In most cases, the fractures were immobilised, stabilised, and realigned with traction before surgery. Internal and external fixation of rods or pins was used to hold the bone in place to allow the bones to align.

Pre-existing morbidities affect fracture susceptibility and the outcomes in an older adult. Osteoporosis is the most common cause of fractures in the elderly and the burden of osteoporosis will increase in the coming years because of the ageing population.[11]

The conservative treatment was indicated in the patients who had manageable fractures and the ones in whom surgeries were contraindicated due to comorbidities such as hypertension, diabetes mellitus, cardiovascular diseases, chronic kidney diseases etc. Comorbidities have been documented as the major preoperative risk factor for the elderly.[12]

The timing of surgery plays an important role in the survival and post-operative treatment outcomes. The early presentation has better prognosis rehabilitation with facilitation for return to work and independence.[13,14] The delay in surgery was seen more in patients having more than one co-morbidities. The stabilisation of the patient and the pre-anaesthetic clearance from different departments is one factor for the delay. Patients with more than 48 hours of delay have been documented to have an overall increase in postoperative complications.[15-16] The lag between the admission and the surgery for patients was within 1-10 days (72.96%). This shows that the institute delivers the service without much delay.

The maximum length of hospital stay was of 0-20 days (77.2%). A prolonged stay at the hospital not only increases the risk of hospital-acquired infections but also constraints the bed availability for new patients.

Majority (67.2%) of the respondents were alive with most of them (81.56%) having an ADL score > 6. About one third (32.74%) died due to unsuccessful operation (10.81%), refractures (5.41%), old age (16.22%), comorbidity (8.11%), multiple organ failure (2.70%), heart failure (8.11%), internal bleeding (2.70%), renal failure (5.41%), loss of interest in living (10.81%), health deterioration after fracture (18.92%), cancer (2.70%), cardiac issues (2.7%), and some unknown reasons (5.41%). Chest infection and heart failure are the most common postoperative complications which may lead to increased mortality.[9,12,17,18]

Conclusion

The highest age range for fracture occurrence was 60-70 years in the study. Female patients were more than male patients. Femur fracture was the most common. The most common direct cause of the fracture was fall (indoor). The most common comorbidities seen in the past medical history of the fracture patients were hypertension, diabetes mellitus, or cardiovascular diseases. Open reduction, internal fixation, and arthroplasty were the commonest treatment performed. The highest delay in reporting was 0-5 days. The highest lag time between the patient arrival to the health care and surgery was 0-5 days. The highest length of stay by the patients in the hospital was 0-10 days. At the time of the interview, the majority of the respondents were alive (67.26%) and fully functional.

Recommendations

There is a need to build geriatric friendly houses which are fall-free with non-slippery floors, rest areas, ramps, and easily approachable cabinets for various daily activities by the elders. Making elderly-friendly roads and streets, places to rest, a secure environment, and green spaces can help older adults have a more active lifestyle. Early reporting of patients to the medical facility after the fracture can improve postoperative outcomes.

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