Assessment of management and outcomes of fragility fractures around the hip joint in a tertiary care hospital

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Abstract

Purpose: Gap exists between the current guidelines for the management of fragility fractures around the hip in our country versus the best practice guidelines as defined in the British Orthopaedic Association Blue Book. We envisage to study the reasons and possible solutions to bridge them.

Methods: Longitudinal observational study with 170 patients (age > 50 years) with fragility fracture of proximal femur were recruited. Patients with pathological fractures and multiple fractures were excluded. We compared our fracture management with the British Orthopaedic Association Blue book for fragility fractures. The mortality rate at one, three, and six months follow-up was also noted.

Results: 43% patients reported to the hospital within 4 hours after injury and 38.8% reported after 24 hours. 96.2% of the cases were admitted within 4 hours of presentation to casualty and 100% within 24 hours. 1 patient was operated within 48 hours of hospitalization, 23 were operated between 3-7 days and 49 after a week. 4 patients developed bed sores. No patient got an orthogeriatrician assessment, no patient was assessed for the need for anti-resorptive therapy and no patient was offered multidisciplinary assessment to prevent future falls. Total deaths were 3, 1 and 0 at 1, 3 and 6 months of follow-up.

Conclusion: Significant gap exists in hip fracture management in our hospital compared with the best practice guidelines as mentioned in the British Orthopaedic Association blue book. Development and implementation of proven guidelines and standard protocols of care for older people with hip fractures in India will help to improve this situation.

Keywords: Fragility fracture, osteoporosis, geriatric medicine, hip fracture

Introduction

It is estimated that by 2050, nearly half of the global burden of hip fractures will be seen in Asia [1]. A report in 2004 estimated an annual incidence of 6 lakh osteoporotic hip fractures in India which is expected to increase significantly as percentage of people over 60 years rises from 5.6% in 1961 to 12% by 2026 [2, 3]. The prevalence of comorbid conditions and frailty is high in the elderly patients with hip fractures and they are at risk of developing complications, despite successful surgical treatment due to the burden of illness [4, 5]. In 2004 national hip fracture database was conceived as a clinical-led collaboration between the British Orthopaedic Association (BOA) and the British Geriatric Society, professional association that cover England, Wales, and Northern Ireland [6]. It was launched in 2007 with the aim of improving hip fracture care using clinical standard, audit and feedback [7]. Management of elderly with hip fractures require co-ordination between Orthopaedic and Geriatric Medicine departments. It helps in achieving the target of early surgery, mobilization and discharge from hospital with decrease in mortality [8]. Daily geriatric care reduce the in-hospital mortality and medical complications in elderly patients with hip fracture [9]. Falls risk assessment should be done in patients over 50 years admitted to the hospital with fragility fractures to reduce future fracture risk [10]. Targeting anti-resorptive treatment to patients who have been confirmed to have osteoporosis have shown to reduce the risk of fracture around the hip [11]. However, there is limited data about how these fractures are managed in our country [12] therefore, we have undertaken this study to assess the current practice of management of hip fractures in our hospital, to compare the current practice with the best practice guidelines as
documented in the British Orthopaedic association blue book for fracture care of patients with fragility fractures and to assess the reasons for the gap between current practice and best practice guidelines and suggest possible solutions.

Materials and Methods
Longitudinal observational study was conducted from November 2017 to April 2019 in the after obtaining approval from ethical committee of the institution and in accordance with the ethical standards as per the Declaration of Helsinki, 1964. 170 patients with age more than 50 years, with fracture of the proximal femur due to a trivial trauma were enrolled for the study after taking informed consent. Mean age of the patients was 66.03 years (SD±10.7, range 50-93) with 91 men and 79 women were included. Patients with pathological fractures, terminal malignancies and psychiatric disorders were excluded. Detailed history about the mechanism of injury and pre-injury mobility status were taken. A note on number of patients who reported to the hospital within 4 hours (n=73), between 4-24 hours (n=31) and after 24 hours (n=66) since injury was made and reasons for delay of more than 24 hours like non-availability of attendant’s (n=43), lack of awareness (n=6), referred from other hospitals (n=5), absence of means of transport (n=8) or any other (n=4) were recorded. After examination of the affected hip plain radiographs of the pelvis with both hips with limbs in 15° internal rotation, antero-posterior (AP) view of pelvis with both hips and AP view of the affected hip with thigh were obtained and investigations needed for pre-anaeesthetic clearance were done. Fracture was classified as fracture neck of femur (n=37), fracture intertrochanteric femur (n=116), fracture subtrochanteric femur (n=12) and combination of the latter two (n=5). The time between admission and surgery was noted and the reasons for delay like presence or detection of new co-morbidities, non-availability of operation theatre time, non-availability of implants and any other were noted. We performed various procedures as per the fracture requirement. Complications during the in-hospital stay especially bed sores were recorded. Record of whether patients received anti-resorptive therapy and falls prevention assessment was documented. During the study between March 2018 to October 2018 the image intensifier was out of order therefore as per the departmental policy, 90 patients were referred to the other government hospitals and among the rest of 80 patients 4 patients were lost to follow-up. We compared our fracture management with the best practice guidelines as documented in British Orthopaedic Association Blue book for fracture care of patients with fragility fractures and we assessed the reasons for the gap between current practice and best practice guidelines.

Statistical analysis
Data was entered in MS Excel spreadsheet and analysis was done using statistical Package for social science (SPSS) software version 20.0 categorical variables were presented in number and percentage (%) and continuous variables were presented as mean ± standard deviation and range.

Results
Out of 80 patients, 73 patients were operated and 7 patients were managed conservatively and of 73 operated patients, only one (1.4%) patient was operated within 48 hours of hospital admission, 23 (31.5%) were operated between 3-7 days and 49 (67.1%) patients took more than a week to get operated. 4 patients had developed bed sores during the hospital stay. No patient got an Ortotgeriatrician/ trained physician assessment from the time of admission and physician assessment was done only for managing co-morbidities. No patient was assessed to determine their need for anti-resorptive therapy and no patient was offered multidisciplinary assessment and intervention to prevent future falls. Three patients had died by the end of one month follow-up, one patient died between one and three months follow-up and no additional deaths were reported between 3 and 6 months of follow-up and 4 patients were lost to follow-up. The data from UK National hip fracture database (NHFD) 2012 [13] and UK NHFD 2018 [14] were used for comparison with our current practice and is depicted.

Discussion
We found major differences in the management of hip fracture in our hospital with respect to the recommended evidence based guidelines outlined in the UK Blue Book published by British Orthopaedic Association. NHFD aims to improve the quality and effectiveness of hip fracture care and it has been reporting the progress of the fracture management in elderly since 2010. They collect data points that address 6 key areas of review that are - admission to an acute Orthopaedic ward in 4 hours of presentation, surgery in 48 hours of admission, development of pressure ulcers, preoperative medical assessment, bone health assessment with treatment at discharge and specialist falls assessment.

As per UK 2012 database 52% of the patients were admitted within 4 hours and 100% were admitted within 24 hours of presentation to acute orthopaedic ward whereas 39.7% of them were admitted within 4 hours in 2018 and the data on percentage of patients admitted within 24 hours as per 2018 database is not available. In our study 96.2% of patients were admitted within four hours of presentation to our casualty and 100% within 24 hours. Our results are better than those of the UK NHFD 2012 and UK NHFD 2018 because in our hospital patients who are suspected of having a fracture are directly sent from casualty to the Orthopaedic emergency then the Orthopaedic resident admits them to an acute Orthopaedic ward so there is no major delay from the hospital presentation to admission. A short length of stay (<4 hours) in emergency department is typically seen in a well-functioning system. Unfortunately in a busy hospital, the length of time spent in the emergency department may be longer [15]. Therefore the potential roadblock is the emergency department itself. In the United States, emergency departments are overcrowded, lack of triages lengthen the stay in emergency department, especially for an elderly who are considered least important [16].

Large number of patients in our study presented late to the hospital following the injury and the reason for the delay was mainly due to non-availability of attenders at home during day time (65.1%), patient’s unawareness about the hip fracture (3.5%) and long distance from their native places to our hospital. Non availability of transportation to the hospital and lack of adequate resources (4.5%) at the nearby district hospitals and negligence of the patients by the attenders were the other reasons for the late presentation. Most of the patients were referred from the district hospitals due to non-availability of infrastructure and facilities for fracture fixation (2.9%). To reduce the time to presentation, pre hospital transportation services should be improved by providing ambulance service, people should be made aware about the fracture treatment and its availability through the mass media and also primary and community health centers. Improving
our government hospitals with more manpower and good infrastructure and health insurance services in private sector for the poor will also improve the trauma care in elderly. 70.2% of the patients with fragility fracture underwent surgery in UK in 2018 within 36 hours of admission but 83% of the patients were operated within 48 hours from admission in 2012. We observed that only 1.4% (1/80) of admitted patients have undergone surgery within 48 hours from hospital admission, it was less than those reported by M. Tian et al. (8%) [17] and Rath et al. (30%) [18] studies. In India, preventive and primary health care is almost non-existent hence patient come in contact with a hospital only when they have major medical event therefore they have undiagnosed/uncontrolled comorbidities on presentation, which delays surgery. We observed that time taken to manage the comorbidity was more when the patient had more than one comorbidity. Shorter operational hours of OT, paucity of facilities in emergency OT for the fracture hip fixation, heavy trauma load and non-availability of implants for surgery were other reasons responsible for the long waiting list for the patients having fragility fractures. In our hospital there is no integrated care pathway for the management of patients with fragility fractures therefore there is no co-management and optimization of these patients and our hospital being the only tertiary care center in the region is the reason for heavy workload. Early detection and better management of comorbidities at the primary health care level, provision of a geriatrician/trained physician on duty to assess the patients at admission and dedicated operation theatre for the elderly people with round the clock facilities can shorten the time taken from hospital admission to surgery. Laboratory investigations like echocardiogram, cardiac stress tests, pulmonary function tests etc. are to be ordered only when necessary.

3.7% in the UK NHFD 2012 developed bedsores during the hospital stay and this data has not been reported in the NHFD 2018. 5% of patients developed pressure ulcers in our study. M. Tian et al. [17] reported that 2% patients developed pressure ulcers. The possible reasons for more pressure ulcers in our study were due to delay in performing surgery, delayed mobilization post operatively and low nurse-patient ratio in India, in our study the average mobilization day from surgery was 10.9 days, whereas in UK, 78.8% patients got out of bed by the day after surgery. To address this problem one must prevent the development of pressure ulcers, air mattress or soft beds should be used, quality nursing care must be provided, fractures should be operated as early as possible and early postoperative mobilization should be done. Physiotherapy and nursing education are main things required for the early postoperative mobilization of elderly with hip fractures. 43% patients got Orthogeriatric/ trained physician care and 91.2% as per UK NHFD 2012 and 2018 respectively. In our study no patient got Orthogeriatric care as there is no Orthogeriatric/separate medicine unit to treat the old patients with fragility fractures. In India old persons with hip fractures are treated by Orthopaedic surgeons with input from physicians/ Orthogeriatricians only when there is a need for intervention for ailments like diabetes, hypertension, poor pulmonary function etc. Ideally it is necessary to have a separate Orthogeriatric unit to assess all the patients with hip fractures during hospital admission and studies have shown reduction in the mortality when there was orthogeriatric intervention [19] and a targeted programme for geriatric care like National program for health care of the elderly (NPHCE)

must be expanded.

In UK 69% and 96.3% patients got assessment for the osteoporosis in 2012 and 2018 respectively. Lack of osteoporosis management and falls risk assessment is a significant gap in our study, no patient was assessed for the osteoporosis or assessment for risk for falls both in our study and study by Rath et al. [18] but M. Tian et al. [17], found that only 0.3% of patients got osteoporosis treatment. In 2009, Khadgawat et al. [20], concluded that prevalence of vitamin D deficiency in Asian-Indian patients with fragility fractures are very high. Because of this low vitamin D majority of fractures occurs due to low impact injury like minor falls in the bathroom. Limited DEXA scan facilities in India is a barrier to osteoporosis assessment [21] and the concept of risk prediction are nonexistent. There should be fracture liaison services in every tertiary care center, which is a co-ordinator based secondary fracture prevention service aims to assess patients for need of anti-resorptive treatment and falls prevention risk assessment in patients with osteoporotic fractures [16, 22]. Discharge instructions for patient with fragility fracture should include calcium supplementation of 500 mg daily, may need 1200mg daily if low calcium diet or malabsorption issues; Vitamin D3 at 2000IU daily [20]. 92% and 95.7% of the patients got multidisciplinary assessment and intervention to prevent falls in future according to 2012 and 2018 UK NHFD database respectively. In our study no patient was assessed for future risk of fall. As people get older they are more likely to fall due to poor balance, muscle weakness, visual impairment. Strength and balance training for those at low to moderate risk of falls, multifactorial intervention for those at higher risk of falls and those who have had a fragility fracture and an exercise programme to improve balance, muscle strength, general fitness improvement can prevent falls.

We reported mortality rates at one month, three months and six months period as 3.8%, 5.2% and 5.5% respectively, similarly Rath et al. [18] reported a mortality rate of 3% at 1 month but the mortality rate according to UK NHFD 2012 and UK NHFD 2018 at one month were 8.4% and 7.1% respectively. Our study has shown, low mortality rate as compared to the other studies, this may be an inappropriate comparison as significant loss to follow up could suggest that more patients may have died after the discharge. The strength of our study is that it is one of the very few studies which has collected data about how fragility fractures are managed in a tertiary care hospital in India. We have also identified the gaps between our treatment and the best practice guidelines, thus this data can be used to bridge this evidence practice gap, and improve care in the future. The major limitation of our study is that, of total 170 patients who reported with a fragility fracture during the study period only 80 were admitted, the remaining 90 patients was referred to other Govt. hospitals due to nonfunctioning of image intensifier and the data about their management could not be compared. Although this was a major limitation of the study, still we could identify major evidence practice gap in a large tertiary care hospital in the management of elderly patients with fragility fractures.

**Conclusion**

Significant gaps exists in hip fracture management in our hospital compared with the best practice guidelines mentioned in the blue book published by British Orthopaedic Association. The development and implementation of proven guidelines and standard protocols of care for older people
with hip fractures in India will help to improve this situation.

Conflict of interest
The authors declare that they have no conflict of interest.

References