Original Research Article

The incidence and pattern of geriatric limb fractures in Ibadan, Nigeria

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ABSTRACT

Background: Individuals within the geriatric age group sustained different types of fractures as such the need to determine the incidence and pattern of limb fractures among patients 65 years and above admitted through the accident and emergency department of the University College Hospital Ibadan.
Methods: A retrospective hospital-based study in which patients 65 years and above admitted through the accident and emergency department of the University College Hospital Ibadan over a 42-month period were involved in the study. Using a proformal completed from the electronically stored data that captures the patient's history, examination findings, X-ray film and treatment offered which was collected on a weekly basis.
Results: 12.58% of the patients reviewed within the study period were geriatric patients. A total of 98 geriatric patients were reviewed. There were 59 female and 39 male with a ratio 1.5:1. The fractures were mostly secondary to a trivial fall within their homes (68.37%) while traumatic injury from motor vehicle and motor bike crashes accounted for 11.22% and 16.33% respectively. The most commonly fractured bone is the femur and the proximal third is the most affected part. Comminuted fracture is the most common pattern observed.
Conclusions: More than 10% of the reviewed population was in the geriatric age group and the proximal femur was the most commonly fractured bone in this age group. They usually follow trivial falls.

Keywords: Fall, Fractures, Geriatrics

INTRODUCTION

Traditionally, elderly patients are those individuals over 64 years.[1] This age group according to Houghton et al can be further sub divided into old (65-74 years) and aged (over 74 years).[2]

In Nigeria according to estimates from the 2006 census the individuals in this age bracket account for 4% of the total population of Nigeria.[3]

In 2008, elderly patients accounted for more than 5.8 million emergency department visits for injuries in the United State of America and this contributed about 30% of all visits by older adults and 14% of all injury-related emergency department visits.[4] Poor record keeping in sub Saharan Africa makes the estimation of such a value difficult. However, it is expected that as the number of people over the age of 65 years begins to increase in the population, the proportion of injuries that occur among these individuals, who are then cared for as hospital inpatients, will also increase.[5]

Trauma is the fifth most common cause of death in the elderly.[6] There are different mechanisms of injury leading to fracture. They include falls, pedestrians struck by motor vehicles, motor vehicle crashes (MVC), assault, domestic abuse and penetrating injury.[7,8] It has been suggested that osteoporosis, fall and fall related injuries are major public health challenges that call for global attention especially within the aging population.[9,10]

Fall has been observed to be the most common mechanism of injury in the geriatric age group.[11] It is defined as the inadvertent coming to rest on the ground, floor or other lower level which exclude intentional change in position to rest in furniture and it is a marker of frailty.[9,12]

The effect of fall and osteoporosis has been observed to cause fractures of different bones.

Other risk factors for fall are restricted mobility, more frequent use of multiple medications, being a widow, disturbance of gait following a rest period, lighting change, an absent or abnormal plantar reflex, failure to wear prescribed spectacles, the presence of anxiety or depression, a history of former wearing of high heels, a sustained drop in pulse pressure 5 minutes after cessation of a rest period.[13-15] Among community dwelling older people over 64 years of age about 28-35% of them fall each year.[9,16]

MVC were the next most common and accounted for 27% of admissions.[17] Major factors that contribute to a crash include vehicle speed, vehicle stability, braking deficiencies, inadequate road design, and driver alcohol intoxication. Following collision factors that determine the likelihood of injury and injury severity include speed at impact, vehicle safety features and the use of restraints.[18]

Injuries resulting from falls in older people include fracture, hematoma, joint dislocation, severe laceration, sprain and soft tissue injury, however the most common injury is fracture.[12]

A total 24% of those who fell had serious injuries and 6% had fractures.[15] With the increased presence of comorbid disease as well as the effects of age, there is increased morbidity and mortality.[19,20]

Over the age of 60 years, females are 2.3 times more likely to sustain a fracture.[7,21] In England and Wales the lifetime risk of a fracture in individuals above 50 years of age was 53.2% for women and 20.7% for men and it was also observed that fractures involving the vertebral, distal forearm, hip, proximal humerus, rib, clavicle, pelvis were more common in the later life.[22]

A study done in America in individuals above 65 years showed that fractures of the hip were the most common and it account for 38% of the fractures identified. The proximal humerus, distal radius/ulnar and the ankle also were common fracture sites with a rapidly increasing rates with age for fractures involving pelvis, hip and other parts of the femur among women.[23]

In white elderly women with fractures, 16% occur in the hip, 9% in the distal forearm, 5% in the proximal humerus and 4% in the ankle. Black women and white men have substantially lower risks and the risks for black men are very low. White women have particularly high risks for all fractures.[24-26] In men only the incidence of hip and humeral fractures increased with age.[7]

Objectives

- Determine the incidence of fracture among patients 65 years and above admitted through the accident and emergency department of the University College Hospital Ibadan.
- Observe the pattern of fractures among patients 65 years and above with fractures that presented at the accident and emergency department of the University College Hospital Ibadan.

METHODS

The study is a retrospective hospital-based study to determine the incidence and the pattern of limb fracture in patients 65 years and above who were admitted through the accident and emergency department of the University College Hospital Ibadan.

The University College Hospital Ibadan is an 850-bed teaching hospital. It is located in Ibadan, the capital of Oyo state, southwest Nigeria. It is also a referral centre for hospitals in the neighboring states.

Eligibility criteria

Patients who are 65years and above with radiologically diagnosed long bone fractures who presented to the accident and emergency department of the hospital between January 2016 and June 2019 were involved in the study.

Data were obtained using a predesigned proformal which was completed from the electronically stored data at the department of surgery University College Hospital Ibadan. Data captured included the patient's history, examination findings, X-ray film and treatment offered which was collected on a weekly basis from the accident and emergency department and presented at the weekly fracture forum of the department of Orthopedic Surgery University College Hospital.

Other information retrieved through the proformal also included the biodata, presence of co morbidity, mechanism of injury, distribution of the fractures by the bone involved, the fracture pattern and treatment modality.

The data was collected over a 42 months period extending from year January 2016 to June 2019. Fractures in patients below 65 years age were excluded from the study.

Fractures in patients below the stated age group were excluded from the study as well as fractures involving the skull, spine, the ribs and other non-long bones.

Statistical analysis

The data was entered and analyzed using Statistical Package for the Social Sciences version 15.

RESULTS

A total of 779 patients were managed within the period reviewed of which 98 patients involved patients above 65 years (Figure 1).
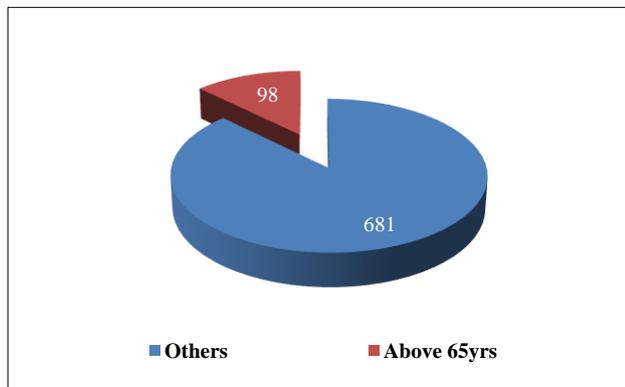

Figure 1: Total number of patients seen within the study period.

Table 1: Gender, co-morbidity, side affected and fracture type.

Sex	Number of patients	Percentage
Male	39	39.80%
Female	59	60.20%
Total	98	100.00%
Co-morbidity		
Hypertension	26	26.50%
Diabetes	12	12.25%
None	60	61.25%
Total	98	100.00%
Side affected		
Right	59	60.20%
Left	39	39.80%
Total	98	100.00%
Type of fracture		
Open	11	11.22%
Closed	87	88.78%
Total	98	100.00%

There were 59 female and 39 males with ratio 1.5:1 (Table 1). The fractures in these patients were mostly secondary to a trivial fall within their homes (68%), while traumatic injury inform of motor vehicle crash and motor bike crash account for the majority of the rest at 11% and 16% respectively (Figure 2).

Eighty-six fractures (88%) were closed while 12 fractures (12%) were open. The most common co morbidity is hypertension. And the right half of the body was mostly fractured (Table 1).
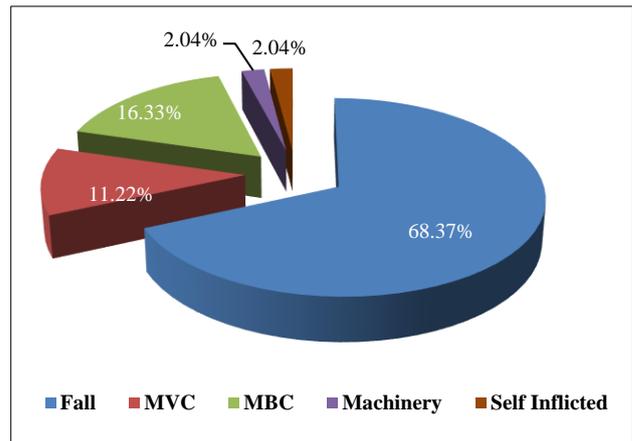

Figure 2: Mechanisms of injury in percentages.

Table 2: Fracture distribution according to bone involved.

Bone	No .	Percentage
Clavicle	1	1.02%
Humerus	9	9.18%
Proximal	5	
Middle	2	
Distal	2	
Radius and ulnar	13	13.27%
Proximal	0	
Middle	1	
Distal	12	
Pelvis	1	1.02%
Femur	52	53.06%
Proximal	47	
Head	0	
Neck	23	
Pertrochanteric	18	
Subtrochanteric	6	
Middle	1	
Distal	4	
Tibia and fibula	22	22.45%
Proximal	10	
Middle	8	
Distal	7	
Total	98	100.00%

Seventy-five fractures occurred in the lower limbs while 23 occurred in the upper limbs. Of all the fractures, 47 fractures (48%) occurred around the hip joint and distributed as neck fracture (23), pertrochanteric fracture (18) and subtrochanteric fracture (6) while 5 fractures involve the mid and distal third of the femur bone (Table 2).

The proximal third of the tibia and fibula bone is the most commonly affected part of these bones while distal third of the radius and the ulnar is the most affected part of the upper limb and this is followed by the proximal third of the humerus (Table 2).
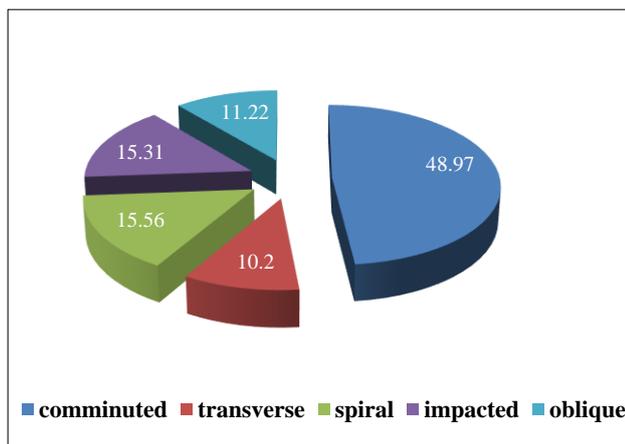

Figure 3: Pattern of fractures in percentages.

Comminuted fracture pattern is the most common pattern observed in this group of patients (Figure 3).

DISCUSSION

A total of 779 patients with long bone fractures presented within the study period of which 98 patients (12.58%) fell within the geriatric age group.

Majority of the patients (60.20%) involved in this study were female while 39.80% were male with a male to female ratio of 1:1.5. As observed by Singer et al, females are 2.3 times more likely to sustain a fracture than males when above 60 years of age, this is also the case in this study, although at a lesser rate.[7,21]

Trivial fall is the most common mechanism of injury observed in this study accounting for 68.37% of cases. Some of the risk factors associated with fall include restricted mobility, more frequent use of multiple medications, disturbance of gait following a rest period, lighting change, failure to wear prescribed spectacles, the presence of anxiety or depression.[13-15] Similar studies had shown that fall in the elderly is linked with a higher risk of fracture.[28-30]

Motorbike crash and motor vehicle crash accounted for 16.33% and 11.22% of the mechanisms of injury

respectively. Crashes from the use of motor bike have increase in this environment because of its use for income generation in commercial public transportation and for its easy accessibility to places with poor road network.

Hypertension is the most common co morbidity observed in this study, which differs from the outcome of study done in the United State of America that found congestive heart failure, chronic pulmonary disease and diabetes mellitus as the most common co morbidity.[27] Hypertension being one of the most common morbidity in the black population may be the reason for this observation in this study.[31]

Most of the fractures are closed fractures (88.78%) and open fractures accounted for 11.22%. Fractures of the femur bone occurred in 52 patients (53.06%) and it is the most commonly fractured bone in the studied population. 47 of the fractures involving the femur bone occurred in the proximal third of the bone. Higher age groups have been associated with higher incidence of pertrochanteric and intracapsular neck fractures.[32] Most of the patients in this study are within the age of 65-74 years.

Other fracture types observed in this study in descending order include tibia and fibula fractures (22.45%), radial fractures (13.45%) and humeral fractures (9.18%). Distal third of the radial bone is the most commonly fractured part of the forearm. However similar study done in Australia showed fracture at the distal forearm as the next most common following proximal femur fracture.[10] The reason for this observation in this study may be due to the higher use of motorbike as a means of transportation in Nigeria as it forms a veritable modality of movement.

The most common fracture pattern is comminuted fracture. The studied population is the geriatric age group as such with increased risk of osteoporosis may account for this fracture pattern observed.

CONCLUSION

Limb fractures in the geriatric age accounted for more than 10% of the total patient reviewed within the study period. The femur bone was the most commonly fractured bone and the proximal third of the bone is the most affected part. They usually follow trivial falls as such processes that will reduce the risk of falls in this age group will go a long way in reducing the incidence of these fractures.

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