

GERIATRIC TRAUMA - EPIDEMIOLOGY AND OUTCOME AT CEDARCREST HOSPITALS, ABUJA, NIGERIA

V.O. Ogbu, MBBS, FWACS (Orth & Trauma), FMCOrth, F. Ogedegbe, MBBS, FWACS (Orth & Trauma) and K. Ekwe, MBBS, FWACS (Orth & Trauma), Cedarcrest Hospitals, Abuja, Nigeria

Correspondence to: Dr. Valentine O. Ogbu, Cedarcrest Hospitals, Abuja, Nigeria. Email: voogbu@gmail.com

ABSTRACT

Background: Trauma is a major public health problem with huge economic and social implications. Old age and co-morbidities generally affect the outcome of traumatic injuries in elderly patients, and the impact of trauma on elderly patients has generally been overlooked.

Objective: To describe the epidemiology and outcome of trauma on elderly patients.

Design: This was a retrospective study that was conducted at Cedarcrest Hospitals, Abuja, Nigeria.

Method: Data were collected from the electronic medical records for all patients aged 65 years and above who visited the emergency department as a result of traumatic injuries.

Results: A total of 82 patients were recruited for the study. The prevalence of geriatric trauma was 4.9%, and fall was the commonest mechanism of injury (67.1%). Ninety eight point eight percent had a revised trauma score of 12 while the injury severity score ranged from 1 to 15.

Conclusion: Geriatric trauma is relatively common in our environment and efforts should be made to prevent falls in the elderly.

Key words: Geriatric trauma, Epidemiology, Outcome

INTRODUCTION

Geriatric trauma is rapidly becoming a major healthcare concern, and the number of geriatric trauma is increasing as the population ages (1,2). Trauma is a major surgical disease and mostly affects young people, the active age group. Nigeria, a developing country has a young population and the burden of trauma in individuals aged more than 65 years is either under-researched or overlooked. Prevention of communicable diseases and maternal and child health have been the major thrust of government health policy. The proportion of elderly patients will continue to increase in Nigeria as the economic condition of the country improves. The elderly are prone to injuries because of physical changes associated with ageing like poor vision, hearing loss and decline in neurocognitive function (3). A number of factors are known to contribute to the poor prognosis of geriatric trauma. This includes underlying co-morbidities, multiple drug use and poor physiological reserve (4,5). Geriatric rehabilitation centres are almost non-existent in Nigeria, and this impacts negatively on the outcome of care. The German Society of Trauma and Orthopaedics has suggested the idea of building specific trauma centres in order to improve the outcome of care in the elderly (6). This study aims to

describe the epidemiology and outcome of trauma on elderly patients as seen at Cedarcrest Hospitals Abuja, Nigeria.

MATERIALS AND METHODS

This was an observational retrospective study conducted from 1st January 2018 to 30th September 2021 at Cedarcrest Hospitals, a private hospital in Abuja, Nigeria. Data were collected from the electronic medical records of the hospital. All patients aged 65 years and above who visited the Emergency Department (ED) as a result of traumatic injuries were included in the study. Patients who presented with traumatic injuries and died shortly after the presentation in the ED were excluded. Data collected included age, gender, initial vital signs, Glasgow Coma Scale, type of injury, cause of injury, Injury Severity Score (ISS), revised trauma score and mortality rate. ISS is an anatomical scoring system that makes use of an Abbreviated Injury Scale (AIS). The AIS divides the body into six regions, and a coded value is given to each region based on the severity of the injuries. In calculating the ISS, the three most injured body regions using the AIS are selected. The highest AIS score for each body region is then squared and the scores summed. ISS ranges from 1 to 75 (7).

It is a good predictor of mortality and the threshold for major trauma is ISS greater than 15 (8).

The RTS is a physiological scoring system based on systolic blood pressure, respiratory rate and Glasgow coma scale. It is calculated by adding the coded values of the components (GCS, RR, SBP). The scores range from 0 to 12 (9). It is a triage tool in identifying seriously injured patients in the emergency unit, and an RTS <11 indicates a survival rate of less than 90% (10).

The outcome measures were trauma-related mortality rate, length of hospital stay, complication and ICU admission rate. Data was analyzed using SPSS version 23 and the results are presented in tables and figures.

RESULTS

A total of 82 patients were recruited for the study. There were 42 males and 40 females with male to female ratio of 1.05:1. Majority of the patients who sustained trauma were within the age range of 65–70 years old and made up approximately 34.1% of the total study sample size (Table 1). A total of one thousand six hundred and seventy two patients with traumatic injuries were seen in the Emergency Department during the study period. Thus, the prevalence rate of geriatric trauma was 4.9%.

Table 1
Age distribution across the sample size and gender groups

Age range (years)	General sample size (%)	Male (%)	Female (%)
65 - 70	34.1	19.5	14.6
71 - 75	26.8	15.9	11.0
76 - 80	19.5	6.1	13.4
81 - 85	9.8	2.4	7.4
86 - 90	7.3	6.1	1.2
91 - 95	2.4	1.2	1.2
96 & above	Nil	Nil	Nil
Total	100%	51.2%	48.8%

X-squared = 8.1714, df = 5, p-value =0.147

Fall was the commonest mechanism of injury accounting for 67.1% of the population (Figure 1).

Further categorization of fall as a mechanism of injury showed that majority of the patients (25.5%) fell in the bathroom (Figure 2).

Figure 1
Distribution of mechanism of injury

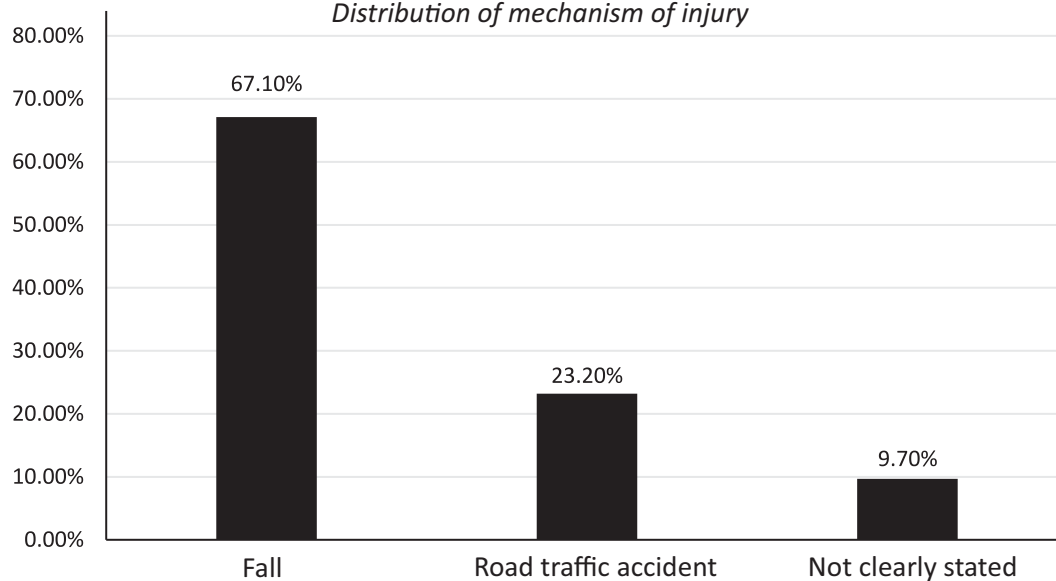
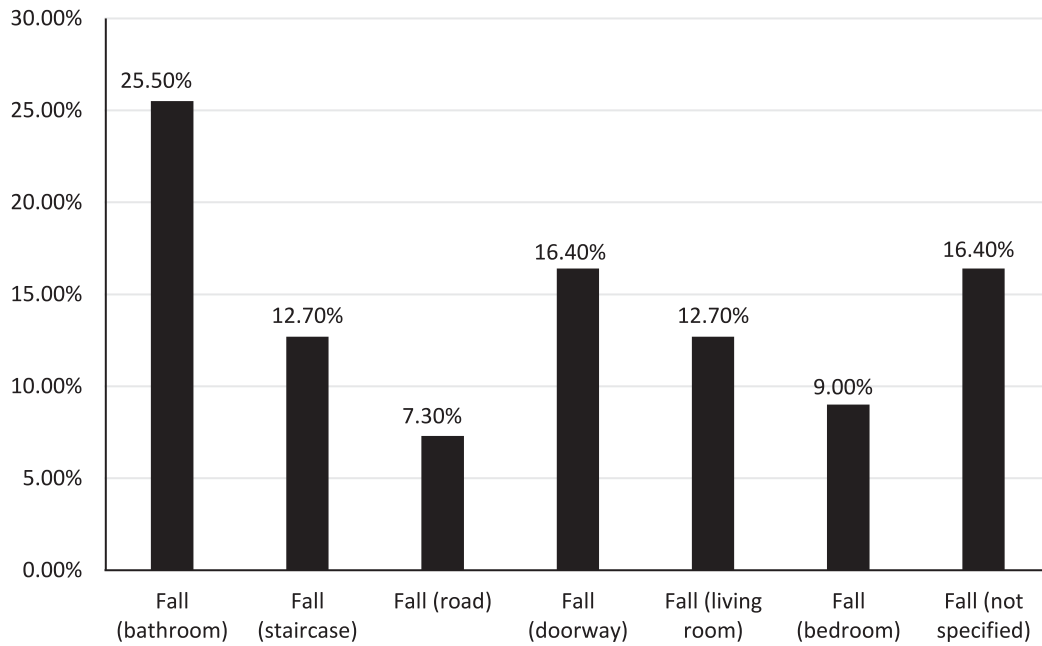


Figure 2
Evaluation of fall as a mechanism of injury



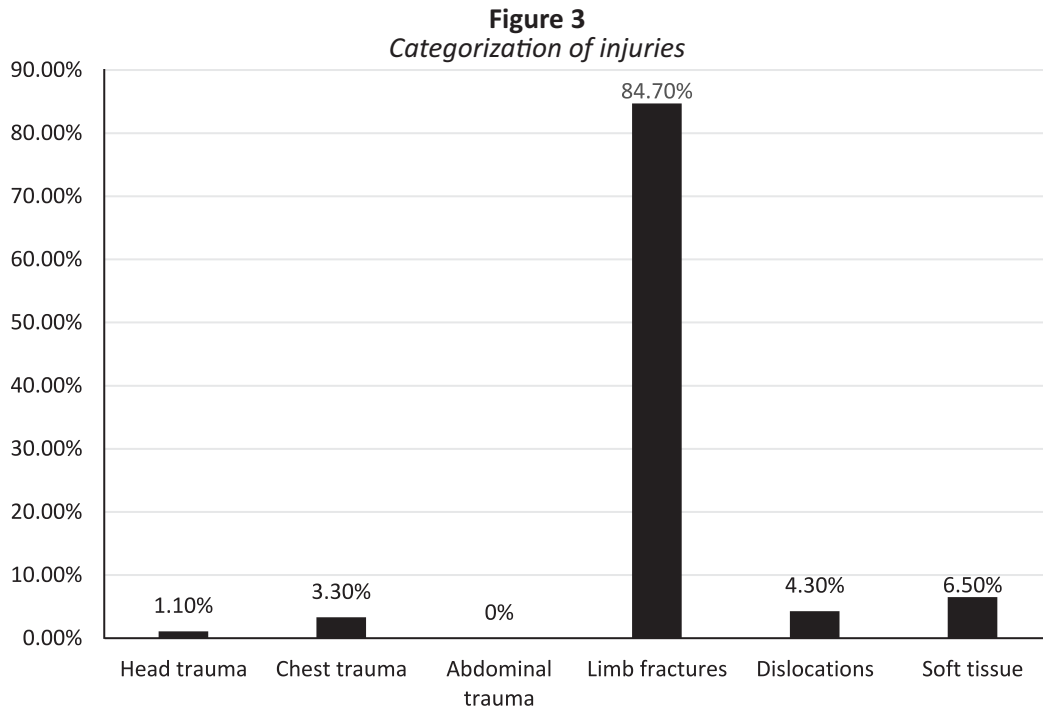
Analysis of the severity of injuries using the Revised Trauma Score, a physiologic scoring system showed that 98.8% of the patients were labelled as delayed while 1.2% needed urgent care. Fifty one

point two percent of the patients had an Injury Severity Score of 9 while only one patient had a score of 15 (Table 2).

Table 2
Analysis of Injury Severity Score (ISS)

Injury severity score	Frequency	(%)
1	2	2.4
4	25	30.5
5	1	1.2
8	8	9.8
9	42	51.2
11	1	1.2
12	1	1.2
13	1	1.2
15	1	1.2
Total	82	100%

Limb fracture was the commonest injury recorded. It was seen in 84.7% of the patients, while 1 patient had head injury (Figure 3).



Further analysis of the limb fractures showed that proximal femoral fractures were the commonest (Table 3). It had the following distributions: intertrochanteric fractures (25.6%) and neck of femur fractures (14.1%). One patient with proximal

femoral fracture did not have surgery and others had the following procedures: DHS with side plate (54.8%), total hip replacement (32.3%), proximal femoral interlocked nailing (9.7%).

Table 3
Categorization of limb fractures

Fractures	Frequency	(%)
Femur intertrochanteric	20	25.6
Femur neck	11	14.1
Femur shaft	2	2.6
Distal femur	5	6.4
Periprosthetic femur	3	3.9
Tibia shaft	4	5.1
Ankle	10	12.8
Patella	1	1.3
Proximal humerus	10	12.8
Humerus shaft	2	2.6
Distal radius	10	12.8

The average length of hospital stay was 7 days (Table 4). The mortality and ICU admission rates were 1.2% and 2.4% respectively.

Table 4
Length of hospital stay

Length of hospital stay (days)	No. of patients	(%)
0	2	2.4
1 – 5	41	50
6 – 10	23	28.2
11 – 15	6	7.3
16 – 20	8	9.7
21 - 25	0	0
26 – 30	0	0
31 - 35	1	1.2
36 – 40	0	0
41 & Above	1	1.2
Total	82	100%

DISCUSSION

The low prevalence of geriatric trauma 4.9% in our study is in keeping with the overall demographic severity in our country, which has a mean life expectancy of 55.75 years (11). Onyedika *et al.* (12) had reported a prevalence rate of 4% among geriatric patients in a national trauma centre in Abuja. The population is aging in the western world and this has significantly increased the proportion of patients presenting with major trauma (13). A large scale study in Europe involving 22,549 patients reported trauma in the form of home injuries or car accidents in 20.2% of those between 65 and 103 years of age (14). Geriatric trauma has a higher male preponderance (1,12). The adventurous nature of men has been suggested as the reason for this (12). All our patients had blunt trauma. This is mostly because of the peaceful co-existence in the cities notwithstanding high level of insurgency in Nigeria. This is in contrast to the high prevalence of penetrating trauma in the elderly and assault rate of 25.3% in South Africa which has a high rate of inter-personal trauma (15).

In assessing the severity of the trauma, 98.8% of patients had a Revised Trauma Score (RTS) of 12. This showed that a greater number of geriatric patients do not present with immediately life-threatening conditions and are categorized as delayed. They usually have less injury patterns (12,16). Only one patient had an Injury Severity Score (ISS) of 15. Various mechanisms of injury have been described by other authors. Fall has been noted as the leading mechanism of injury in several studies (4,16,17). This is similar to our study where 67.1% of injuries were as

a result of fall. Unsteady gait, arthritic joints, poor vision and drug therapies have been attributed as the reasons for the frequent fall seen in elderly patients (4). In the further categorization of where the fall took place, we noted that 25.5% of the falls occurred at the bathroom and this was attributed to wet and slippery floor. Motor vehicular crashes and road traffic-related accidents have also been reported in some parts of Africa and other parts of the world as the leading cause of trauma in geriatrics (12,17,19). In other clime where the crime rate is higher, assault has been reported as the leading mechanism of injury. A study of geriatric injuries among patients attending a regional hospital in Tanzania reported that 52.1% of the injuries were as a result of assault (20).

In analysing the injury patterns, fractures, Traumatic Brain Injury (TBI) and soft tissue injuries have variously been reported. Okoye *et al.* (12) in a study in Abuja reported as follows: TBI 24.3%, soft tissue injuries 22.1%, fracture-dislocation 20.4%. While Chalya *et al.* (20) in Tanzania reported fractures in 52.2% of the patients. TBI has been reported as the most common injury in other parts of the world (16,21,22). The reason for this variation in the pattern of injuries seen the geriatric could not easily be explained by the existing literature. Limb fracture was the commonest injury in our study accounting for 84.7% of the injuries sustained. Our hospital is a leading orthopaedic trauma centre in Abuja and this could have influenced the pattern of injuries noted in the study. A review of the fracture patterns showed that proximal femoral fractures accounted for 39.7% of the injuries. This may be attributed to the high prevalence of age-related osteoporosis in the elderly (23).

In reviewing the outcome of care, ICU admission, LOS, and mortality rate have been used by other authors. A higher mortality rate has been reported in elderly patients following trauma (20,22,24). Mortality rates as high as 14.9% and 11.4% have been reported in Tanzania and South Africa (15,20). Elderly patients fare less than the younger patients because of the poor physiologic reserve, the ageing process, burden of co-morbidities and pre-existing illness. We reported a low mortality rate of 1.2% and this could be explained by the low ISS which ranged from 1 to 15 and the fact that none of the patients had ventilatory support in our study. The mortality rate is significantly related to high ISS and the need for ventilatory support (5,21). Our average LOS was 7 days. This is against 28.6 days and 2.96 days reported in Tanzania and South Africa (15,20). LOS is significantly higher in patients with co-morbidities, long bone fractures and complications (19).

The study has its limitation which included that the long-term outcome of care given to geriatric patients was not studied. Future studies should aim at reviewing functional outcomes and quality of life after discharge.

CONCLUSION

In this study, we have found that geriatric trauma are usually not life threatening at presentation. A good number of them present with hip and intertrochanteric fractures following fall at home. Every effort should be made to create a safe environment at home.

REFERENCES

1. Adams, S.D. and Holcomb, J.B. Geriatric trauma. *Curr Opin Crit Care*. 2015; **21**(6):520–526.
2. Jiang, L., Zheng, Z. and Zhang, M. The incidence of geriatric trauma is increasing and comparison of different scoring tools for the prediction of in-hospital mortality in geriatric trauma patients. *World J Emerg Surg*. 2020; **15**: 59.
3. Horst, M.A., Morgan, M.E., Vernon, T.M., Bradburn, E.H., Cook, A.D., *et al.* The geriatric trauma patient: a neglected individual in a mature trauma system. *J Trauma Acute Care Surg*. 2020; **89**(1):192–198.
4. Kirshenbom, D., Ben-Zaken, Z., Albilya, N., Niyibizi, E. and Bala, M. Older age, controlled illness and injury severity affect immediate outcome in elderly trauma patients. *J Emerg Trauma Shock*. 2017; **10**(5):146-150.
5. Hollis, S., Lecky, F., Yates, D.W. and Woodford, M. The effect of pre-existing medical conditions and age on mortality after injury. *J Trauma*. 2006; **61**: 1255-60.
6. Pape, H.C., Friess, T., Liener, U., Ruchholtz, S., Schmucker, U., *et al.* Development of geriatric trauma centers—an effort by the German Society for Trauma and Orthopaedics. *Injury*. 2014; **45** (10):1513–15.
7. Baker, S.P., O'Neill, B., Haddon, W. and Long, W.B. The injury severity score: a method for describing patients with multiple injuries and evaluating emergency care. *J Trauma*. 1974; **14**:187–196.
8. Boyd, C.R., Tolson, M.A. and Copes, W.S. Evaluating trauma care: the TRISS method. *J Trauma*. 1987; **27**:370–378.
9. Champion, H.R., Sacco, W.J., Carnazzo, A.J., Copes, W.S. and Fouty, W.J. Trauma score. *Critical Care Med*. 1981; **9**:672–676.
10. Champion, H.R. Trauma patient scoring. *Bailliere's Clin Anesthes*. 1992; **6**: 47–66.
11. Statistics. National Population Commission. <https://nationalpopulation.gov.ng>
12. Okoye, O.G., Olaomi, O.O., Osi-Ogbu, O. and Gwaram, U.A. Pattern of trauma in elderly patients seen at the trauma centre of National Hospital Abuja, Nigeria. *Afr J Emerg Med*. 2021; **11**(3):347-335.
13. Kehoe, A., Smith, J.E., Edwards, A., Yates, D. and Lecky, F. The changing face of major trauma in the UK. *Emerg Med J*. 2015; **32**:911-915.
14. Gioffre-florio, M., Murabito, L.M., Visalli, C., Pergohzzi, F.P. and Fama, F. Trauma in elderly patients: a study of prevalence, comorbidities and gender differences. *G Chir*. 2018; **39**(1):35-40.
15. Da Costa, J.P., Liang, J., Kong, V.Y., Bruce, J.L. Laing, G.L. and Clarke, D.L. A review of geriatric injuries at a major trauma centre in South Africa. *S Afr Med J*. 2020; **110**(1):44-48.
16. Win, L.W. Shaun, G.E., Ramalingam, G., Mak K. and Wai S. Epidemiology of trauma in an acute care hospital in Singapore. *J Emerg Trauma Shock*. 2014; **7**(3):174-179.
17. Poli, J.A.L., Perez- Barcena, J., Chico-Fernandez, M. and Sanchez-Casado, M. Severe trauma in the geriatric population. *World J Crit Care Med*. 2017; **6**(2):99-106.
18. Saidi, H. and Mutiso, B. Injury outcomes in elderly patients admitted at an Urban African hospital. *Surg Sci*. 2013; **4**(6):292-297.
19. Krug, E.G. Sharma, G.K. and Lozano, R. The global burden of injuries. *Am J Public Health*. 2000; **90**:523-529.

20. Chalya, P.L., Ngayomelal, H., Mbelenge, N., Dass, R.M., Mchembe, M., *et al.* Geriatric injuries among patients attending a regional hospital in Shinyanga, Tanzania. *Tanzania J Health Res.* 2012; **14**(1). DOI:<http://dx.doi.org/10.4314/thrb.v14i1.4>.
21. Gioffre-Florio, M., Murabito, L.M., Visalli, C., Pergozzi, F.P. and Fama, F. Trauma in elderly patients: a study of prevalence, co-morbidities and gender differences. *G Chir.* 2018; **39**(1):35-40.
22. Raul, C.S., Lin, T.S., Wu, S.C., Yang, J.C.S., SY Hsu, S.Y., *et al.* Geriatric hospitalizations in fall related injuries. *Scand J Trauma Resusc Emerg Med.* 2014; **22**: 63.
23. Li, G., Thabane, L., Papaioannou, A., *et al.* An overview of osteoporosis and frailty in the elderly. *BMC Musculoskelet Disord.* 2017; 18:46. <https://doi.org/10.1186/s12891-017-140>.
24. Hashmi, A., Ibrahim Zaba, J., Rhee, P., Aziz, H., Fani, M.J. Fries, R.S., *et al.* Predictor of mortality in geriatric trauma patients: a systematic review and meta-analysis. *J Trauma Acute Care Surg.* 2014; **76**:894-890.