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Original Research Article

Comparison of orthopedic trauma patterns in geriatric patients during COVID-19 pandemic led lockdown and non-lockdown periods

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ABSTRACT

Background: Lockdown had hindered persons' ability to engage in regular physical activity. Our study analysed bone trauma patients who visited the orthopedic department based on the mode of injury, kind of extremity involved, and the bone implicated.
Methods: This was a retrospective cross-sectional study of patients visiting the orthopedic surgery department of a North Indian tertiary health care centre. Patient data was recorded from the case sheets.
Results: A total of 792 patients' data was collected, out of which 250 patients were those of during lockdown, and 542 patients were of non-lockdown phase. During the lockdown phase, the patients who have undergone RTA were 37 (14.8%), those admitted for domestic trauma were 128 (51.2%), and those for miscellaneous causes were 85 (34%). During the non-lockdown phase, RTA were 145 (26.739%), domestic were 318 (58.608%) and miscellaneous were 79 (14.652%). During lockdown, the site of injury was upper limb in 59 patients, lower limb in 154 patients, vertebrae in 37 patients. In the non-lockdown phase, the upper limb was injured in 95 patients, lower limb in 377 patients, vertebrae in 52 patients and hip bone in 17 patients. Femur was the most affected bone.
Conclusions: There was a decrease in the number of instances during the lockdown. During both the periods, the majority of geriatric patients were from rural areas. Domestic trauma cases were most prevalent in the older age range, and the most common extremity implicated appeared to be the lower limb, with the femur being the most involved bone in both stages.

Keywords: COVID-19, Geriatric, Injury patterns, Lockdown, Orthopedic trauma

INTRODUCTION

Coronavirus disease 2019, a highly infectious disease, created worldwide mayhem and quickly grew into a pandemic, resulting in severe loss of human life, disturbance of people's everyday routines, and compromised mental health. The epidemic caused the government to impose a full national lockdown on March 24, 2020. Throughout the months that followed, the lockdown was divided into many phases, each with its own set of limitations and relaxations.[1]

Stay-at-home policies implemented under COVID-19 have resulted in sedentary lifestyles and hindered persons' ability to engage in regular physical activity in everyday life, including leisure-time, occupational, and commuting physical activity. Containment reduced the exposure to probable fall-related circumstances and, most likely, fractures. However, this strategy may have contributed to de-training repercussions in older persons, such as reduced mobility, muscular strength, and bone health; these negative implications, in turn, may have increased the likelihood of falls and fractures. A fracture

pandemic was caused by sedentary-related reductions in mobility and bone health, the following control as an unintended consequence of stay-at-home methods. Indeed, in geriatric medicine, rebound effects following substantial decreases in physical activity (prolonged bed rest during hospitalisation, physical or pharmacological constraint) are frequently anticipated. It causes reductions in physical and functional capabilities such as walking speed, time to rise from a chair, grip strength, and eventually falls and fractures. Even a 0.1 cm/second drop in walking speed each week predicts falls in older persons.[2] According to research by Tinetti et al, physical confinement eventually increases the likelihood of falls and injuries. This is most likely because, throughout the constraint period, muscle strength, coordination, and balance are lost. These findings helped generate good practice guidelines and enabled a drastically reduced use of restraints in long-term care services.[3]

Although the number of road traffic accidents (RTA) may have decreased during the lockdown associated with the covid-19 pandemic, household injuries and do-it-yourself (DIY) injuries during cooking, gardening, tree climbing, and other activities appear to have increased due to increased participation of people in such activities.[4]

Since families are typically the primary caregivers for their dependent senior relatives during a lockdown, there were significant worries about providing care and support to the elderly population for the whole lockdown time. Due to the isolation measures put in place for the whole lockdown period, family members and caregivers were unable to physically access their senior dependents, increasing the risk of falls and associated geriatric trauma. The financial strain caused by this injury was equally significant. To enhance the prognosis and avoid related problems, morbidity, and death, these patients needed to be treated efficiently and quickly. Acute orthopedic facilities (trauma cases) continued to be provided despite the complete curfew but elective orthopedic services were reduced as a result of the spread of COVID-19.[5]

Our study analysed bone trauma patients who visited the orthopaedic department based on the mode of injury, kind of extremity involved, and even the bone implicated.

METHODS

Study setting and design

This was a retrospective cross-sectional study of patients visiting the Orthopedic surgery department of a North Indian tertiary health care centre.

Study period

Lockdown period data was collected from April 2020 to September 2020, and March 2021 to June 2021, whereas non-lockdown period data was collected from June 2019 to February 2020.

Inclusion criteria

Only patients of age more than 60 years were considered for this study. Only trauma patients visiting the King George's Medical University's orthopedic surgery department were included in the study. Only new patients visiting the King George's Medical University were considered for the study.

Exclusion criteria

Non-trauma orthopedic patients were not considered for the study. Follow up patients during the study period were not considered. Patients with old recurrent injuries were not considered for the study.

Sample size calculation

All patients of age more than 60 years, visiting the orthopedic surgery department were included in the study. Data of geriatric group of patients was collected retrospectively of the following time phases: lockdown period data was collected from April 2020 to September 2020 (six months) and March 2021 to June 2021 (four months) whereas non-lockdown period data was collected from June 2019 to February 2020 (nine months). Total 792 patient had been recorded as per hospital records, out of which 250 were during lockdown period, and 542 were during non-lockdown.

Data collection

Patient data included their age, sex, residence (urban/rural), period of visit (lockdown/non-lockdown), pattern of injury (RTA, domestic, non-RTA/non-domestic), extremity involved in the injury along with the exact site of injury and affected bones in the injury. The data was recorded from the case sheets reported in the orthopedic surgery department.

Data analysis

The data obtained from the case sheets were properly recorded in MS Excel sheets following which it was thoroughly analysed using SPSSv23 software (IBM, USA). To give a proper estimate of the distribution and determinants of injuries, epidemiological pattern and regional injury pattern in the geriatric patients.

Also, determinants were compared between lockdown and non-lockdown phases. Quantitative analysis was conducted using descriptive statistics.

Ethical consideration

The study was conducted only after approval by the Institutional Ethics Committee of King George's Medical University, Lucknow (ECR/262/Inst/UP/2013/RR-19): 112thECM IIA/P5.

RESULTS

A total of 792 patients' data was collected and evaluated during this study of which 250 patients were those of during lockdown, which included 121 males and 129 females, of average age of 66.83±6.16 years; and 542 patients were of non-lockdown phase which included 336 males and 210 females, of average age 69.89±8.76 years.

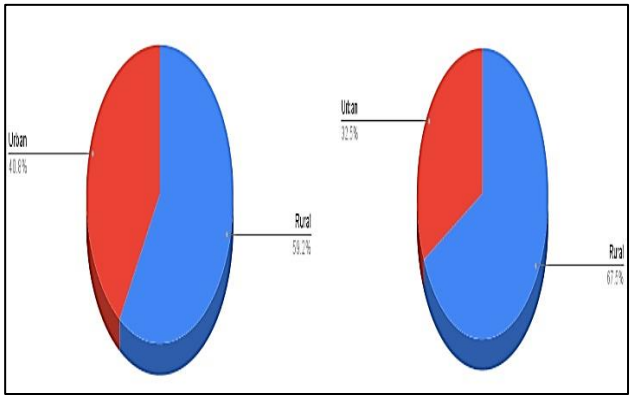

Figure 1: Geography wise comparison of the number of patients affected in lockdown versus non-lockdown phases.

The total number of geriatric patients admitted during the lockdown phase were 250, out of which 148 (59.2%) belonged to rural areas and 102 (40.8%) to urban areas (average age: 66.83±6.16), while the number was way higher in the non-lockdown phase where 366 (67.5%) out of 542 patients belonged to rural areas and 176 (32.5%) to urban areas (average age: 69.89±8.76) (Figure 1).

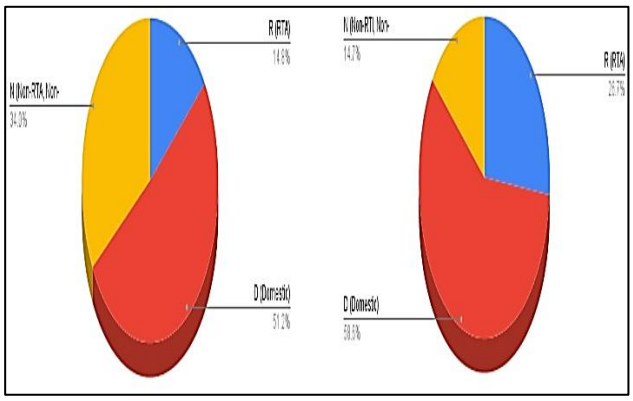

Figure 2: Etiology wise comparison of the number of patients affected in lockdown versus non-lockdown phases.

During the lockdown phase, the patients that have undergone RTA were 37 (14.8%), those admitted for domestic patterns of trauma were 128 (51.2%), and those for other causes (miscellaneous group) were 85 (34%). While during the non-lockdown phase, RTA were 145 (26.739%), domestic were 318 (58.608%) and non-RTA, non-domestic were 79 (14.652%). A significant reduction of 11.939% was noticed in the RTA cases during the lockdown period, while a noteworthy rise of 7.408% was seen in the domestic cases during the lockdown. The miscellaneous non-RTA, non-domestic cases also decreased during the lockdown by 19.348% (Figure 2).

Table 1: Bone wise comparison of the number of patients affected in lockdown versus non-lockdown phases.

Bone	Number of patients (%) in whom the bone has undergone trauma in lockdown phase	Number of patients (%) in whom the bone has undergone trauma in non-lockdown phase
Hip bone	5 (2.058%)	24 (4.524%)
Tibia	21 (8.529%)	44 (8.144%)
Fibula	17 (6.764%)	25 (4.675%)
Femur	93 (37.352%)	26 (48.868%)
Radius	14 (5.588%)	18 (3.318%)
Ulna	15 (6.176%)	18 (3.318%)
Phalanges	2 (0.882%)	3 (0.603%)
Clavicle	4 (1.764%)	3 (0.603%)
Humerus	17 (6.764%)	54 (9.954%)
Carpals	5 (2.058%)	5 (0.904%)
Metacarpals	5 (2.058%)	2 (0.301%)
Metatarsals	2 (0.882%)	9 (1.809%)
Tarsals	5 (2.058%)	3 (0.603%)
Patella	4 (1.470%)	13 (2.413%)
Knee ligament	7 (0.294%)	0 (0%)
Scapula	5 (2.058%)	2 (0.301%)
c3	7 (0.294%)	2 (0.452%)
c4	0%	2 (0.301%)
c5	0%	4 (0.754%)
c6	0%	2 (0.301%)
t1	7 (0.294%)	0 (0%)
t3	0%	1 (0.150%)
t4	0%	2 (0.301%)
t5	2 (0.882%)	1 (0.150%)
t6	2 (0.882%)	0 (0%)
t7	0%	1 (0.150%)
t10	0%	2 (0.452%)
t11	0%	3 (0.603%)
t12	2 (0.882%)	8 (1.508%)
l1	15 (6.176%)	16 (3.016%)
l2	3 (1.176%)	6 (1.055%)
l3	2 (0.882%)	1 (0.150%)
l4	4 (1.470%)	3 (0.301%)
l5	7 (0.294%)	0%

During lockdown, the site of injury was upper limb in 59 patients, lower limb in 154 patients, vertebrae in 37 patients. In the non-lockdown phase the upper limb involvement was seen in 95 patients, lower limb in 377 patients, vertebrae in 52 patients and hip bone in 17 patients (Figure 3).

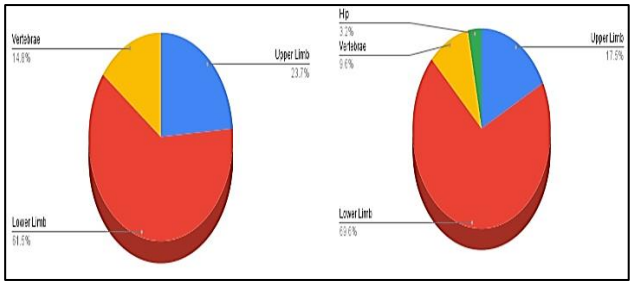

Figure 3: Extremity wise comparison of the number of patients affected in lockdown versus non-lockdown phases.

Femur was the most affected bone- in 93 (37.352%) elderly patients with bone trauma during both lockdown and non-lockdown phases (Table 1).

DISCUSSION

In response to the COVID 19 pandemic, the government instituted a national-level quarantine and lockdown, as well as mobility restrictions except for those in emergency professions. Elective procedures were halted to reduce the danger of viral transmission and to keep beds accessible for patients infected with COVID-19 if the number increased. However, emergency and trauma services were maintained.

Because of these legislative limitations, surgically treated trauma cases decreased significantly as compared to the same time the previous year. There was also a drop in the number of polytrauma patients and road traffic accident cases referred to emergency rooms. On the other hand, trauma cases caused by minor falls have become a prevalent reason for people to attend emergency rooms.[5]

The tendency to fall in the elderly is caused by a variety of innate and extrinsic risk factors. Ageing causes frailty syndrome, a multifactorial decline in health and function that includes decreased intelligence/imagination, orthostatic dysfunction, impaired visual performance and balance, weakness and instability of the musculoskeletal system, and reduced mobility, which may also be due to anxiety. Furthermore, reduced perception in the setting of moderate cognitive impairment (MCI), dementia, or delirium, as well as diseases such as Parkinson's disease, syncope, and many others, might increase the likelihood of falling. Another aspect that is common among the elderly is polypharmacy. Medication side effects or interactions between medications might induce a change in gait behaviour, resulting in falls.[6]

Slip and fall accidents in the bathroom, kitchen, yard, and while performing household duties were the most prevalent causes of an increase in domestic bone injury cases. Many people were known to participate in household cleaning activities including scaling ladders and climbing their house's rooftops due to harsh family confinement, resulting in a significant increase in such accidents.[4]

In our study the total number of patients in the non-lockdown period was 542 against 250 in the lockdown period of the same duration, representing a 53.9% decrease in cases. Falls at home did not decrease considerably, particularly among the elderly. Domestic falls were the major cause of trauma in the elderly over both periods, with a 7.4% drop in the lockdown period (58.608% in the non-lockdown phase, 51.2% in the lockdown phase). The next most prevalent cause of bone damage during the non-lockdown period was Road Traffic Accidents (RTA), which decreased by 11.9% during the lockdown phase (26.739% in the non-lockdown phase, 14.8% in the lockdown phase).

According to the findings, the lower limb was the most commonly implicated extremity. However, during the lockdown period, its prevalence reduced by 8.1% (69.642% in the non-lockdown phase, 61.478% in the lockdown phase). While the occurrences of the upper limb and vertebral damage increased by 6.2% and 5.1%, respectively, during the lockdown phase. Only 3.214% of patients had hip fractures or injuries during the non-lockdown phase and no patients with hip injuries were reported during the lockdown phase. The most prevalent bone injured throughout both stages was the femur, albeit its occurrence dropped by 11.5% during the lockdown period. Vertebrae and ligaments were the least affected throughout both phases.

Orthopedic trauma cases during lockdown and non-lockdown were analysed, and both rural and urban patients had a considerable drop during the lockdown. A review of the literature identified several studies demonstrating a decrease in orthopaedic trauma cases during the lockdown[1,2,4-8] with just a few studies focusing solely on the older demographic.[2,5-7]

The study by Barreto et al revealed a decrease in the number of fracture hospitalisations of older people throughout the COVID year (2020).[2] According to Fadi et al, the proportion of geriatric patients with hip fractures in the lockdown group was considerably greater than in the non-lockdown group, while the overall number of trauma patients was lower. Although the frequency of hip fractures was lower in our research during the non-lockdown phase and considerably lower during the lockdown period.[5] Polan et al discovered that older patients' falls were associated with geriatric comorbidities research.[6] According to a research conducted by Reddy et al, there was a statistically significant drop in the overall number of trauma cases during the lockdown period across all age categories and both genders. In this study, like in ours, falls at home were the leading cause of injury during both stages. In their study, hip fractures were the leading cause of fragility fractures, however, in our analysis, the hip area was the least involved in any trauma.[7] Although there was

a drop in overall trauma cases in research by Dhillon et al, data of the elderly was not statistically insignificant, showing that falls of the elderly continued to occur despite their not travelling out of their homes.[8]

CONCLUSION

Understanding the patterns of trauma cases becomes critical in pandemics for the orthopaedic surgeon to give appropriate care to patients, particularly the elderly. Research like ours will assist them in analysing the trend of patients more frequently visiting them in the outpatient department and preparing for them. Their approach should be focused on clinical urgency, protecting the safety of both the patient and the health care professional, and providing the finest and most timely outpatient care possible so that the danger of exposure to the virus or other illness is minimised. As a result, the patient should get the best possible treatment while the infection is contained. If feasible, facilities should be shifted to their house to reduce the danger of trauma that may occur while travelling or to reduce the risk of infection to themselves and others. The COVID-19 pandemic is not the first to strike the entire globe, nor will it be the last, thus the government, as well as the health care delivery system, must improve the quality of health care during these pandemics so that people do not suffer excessively. This study adds to the existing data on trauma in older patients by providing further information on rural and urban patients. This analysis sheds light on the decrease in the number of instances during the lockdown. During both the periods, the majority of geriatric patients were from rural areas. Domestic violence incidents were most prevalent among the elderly, and the most common extremity implicated appeared to be the lower limb, with the femur being the most involved bone. Domestic trauma cases were most prevalent in the older age range, and the most common extremity implicated appeared to be the lower limb, with the femur being the most involved bone in both stages. Trauma cases might also be reduced by providing better patient care both in the hospital and at home, as well as avoiding excessive physical work at home. This study did not study the comorbidities related to the trauma, the degree of the harm caused, and the outcome of the orthopaedic trauma. All of this might be the focus of future research with a bigger study sample, allowing for a more accurate examination of geriatric trauma patients.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee of King George's Medical University, Lucknow (ECR/262/Inst/UP/2013/RR-19): 112thECM IIA/P5

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