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## ORIGINAL PAPER

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# Impact of Social Distancing on Geriatric Hip Fractures Among Jordanian Population During COVID-19 Pandemic

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## ABSTRACT

**Background:** There were serious concerns about delivering the care and support to the elderly population in Jordan during the full lockdown period. In turn, this raised concerns about how this group of population will care for themselves and if this change in the situation will increase the risk of falls and related geriatric hip fractures. Hip fractures are a significant cause of morbidity and mortality in the geriatric population. Jordan has been affected by the coronavirus disease, COVID-19; pandemic like other parts of the world. The Jordanian authorities acted early to prevent the infection from spread, and lockdown along with social distancing measures were implemented early and enforced. Even though these measures successfully slowed the spread of the virus, some concerns were raised about the delivery of care by the family and caregivers to Jordanian geriatric population. **Objective:** We studied the effect of lockdown and social distancing in Jordan on hip fracture incidence among the geriatric population during the lockdown period. **Method:** This retrospective observational study was conducted at two Jordanian Royal Medical Services (JRMS) hospitals, King Hussein Medical Center and Prince Rashid Hospital. Patients who were treated surgically for traumatic hip dislocation during lockdown (15th March to 30th April 2020) were compared with patients during the corresponding period in 2019 regarding the incidence of geriatric hip fractures. **Results:** The lockdown group included 102 trauma patients, 68 patients (66.7%) had geriatric hip fractures. On the other hand, the non-lockdown group included 144 patients, 45 (31.3%) had hip fractures. Thus, the proportion of patients with geriatric hip fractures in the lockdown group was significantly higher than the non-lockdown group

( $P=0.034$ ). However, the geriatric hip fractures male to female ratio were the same in lockdown and non-lockdown groups (1:1.5). **Conclusion:** During the complete lockdown and social distancing due to COVID-19, the epidemiology of surgically treated fractures changed; there is a decrease in the total number of trauma patients and an increase in the proportion of geriatric hip fractures.

**Keywords:** COVID-19, Jordan, pandemic, hip fractures, social distancing.

## 1. BACKGROUND

China reported the first Corona virus-related pneumonia on 31<sup>st</sup> December 2019. After that, this virus has spread worldwide rapidly. On the 11<sup>th</sup> March 2020, WHO announced Corona virus-related disease, COVID-19, as a pandemic (1). They issued a series of recommendations to protect the populations and health care systems (1). Jordanian government took this worldwide situation seriously and issued a series of measurements to control the virus's spread and prevent an overwhelming health care crisis. On the 15<sup>th</sup> March 2020, the Jordanian government announced a complete national-wide lockdown and implemented new measures to enforce strict social distancing. These measures controlled the spread of the COVID-19.

However, there were serious concerns about delivering the care and support to the elderly population in Jordan during the full lockdown period. In Jordan, usually, family members are the primary caregiver for their dependent elderly relatives. During full lockdown time, caregivers and family members could not physically reach their elderly dependents due to the isolation measures implemented by Jordan's

authorities. In turn, this raised concerns about how this group of population will care for themselves and if this change in the situation will increase the risk of falls and related geriatric hip fractures. Hip fractures are a significant cause of morbidity and mortality in the geriatric population. The one-year mortality rate due to hip fractures has been reported to be nearly 30% (2), despite the improvements in medical care and surgical procedures (3). In addition to this, the economic burden of dealing with this injury is tremendous (4). Therefore, organized and prompt treatment of these patients is crucial to improve the outcome and prevent associated complications, morbidity, and mortality. The spread of COVID-19 disrupted the health care services and led to a reduction in elective orthopedic services. However, acute orthopedic services were running despite the full curfew measures (5, 6).

## 2. OBJECTIVE

This study aimed to identify if the social distancing measures affected the number of hip fractures among Jordan's geriatric population during times of complete lockdown. Therefore, we retrospectively reviewed the number of surgically treated geriatric hip fractures presented to the orthopedic emergency departments at two major trauma centers in Jordan between 15th March and 30th April 2020. Furthermore, these numbers were compared to the numbers of surgically treated geriatric hip fractures presented to the same orthopedic emergency department at the same two major trauma centers in the same time duration during 2019 to avoid any seasonal and geographical effects on geriatric hip fractures' incidence in the study sample.

## 3. METHODOLOGY

This observational retrospective study was conducted after receiving ethical approval from the Institutional ethical committee board. All data were collected from emergency and admission records at two major Royal Medical Service hospitals covering the period between the 15th and 30th April, 2020. The two hospitals involved in this study were King Hussein Medical Center (KHMC), serving the Jordan capital Amman and the surrounding area, and Prince Rashid hospital (PRH), which provides health services to Jordan's north sector.

We included all patients who presented with surgically treated hip fractures with the following inclusion criteria: a) time of presentation between 15<sup>th</sup> March and 30<sup>th</sup> April 2020, the time duration of country lockdown and movement restrictions, and the corresponding duration in 2019; b) traumatic low energy hip fracture; c) no previous treatment was done for this fracture; d) age above 65 years.

Patients with pathological fractures, failed hip fixation cases, and infected cases were excluded from this study.

The included patients in the study received surgical

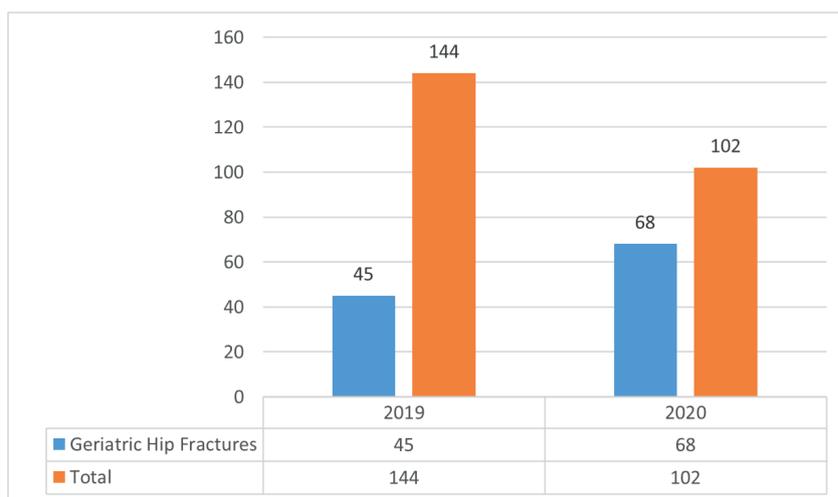


Figure 1. The number of patients with geriatric hip fractures to the total number of surgically treated patients with traumatic fractures in the non-lockdown period 15th March to 30th April 2019 and the complete lockdown period of 15th March to April 2020.

treatment after medical optimization with fracture fixation by Dynamic Hip Screw (DHS) or Proximal Femoral Nail (PFNA), or hemiarthroplasty, depending on the fracture location and stability.

We used the statistical package IBM SPSS version 25.0 for the data analysis.

## 4. RESULTS

The data was collected from the two hospitals' registries during the designated period for 2019 and 2020, respectively.

One hundred and two patients with fractures that mandated surgical treatment during the lockdown period were admitted; 68 patients were diagnosed with hip fractures representing 66.7% of fracture cases. During the same period in 2019, 144 fracture cases were admitted, 45 patients had hip fractures, representing 31.3% of all the cases, and these were grouped as the non-lockdown group, as shown in Figure 1.

We observed a statistically significant increase in the absolute number and the percentage of geriatric hip fractures in the lockdown group (68 cases, 66.7%) compared to the non-lockdown group (45 cases, 31.3%), ( $p$  value=0.034), despite the decrease in the total number of surgically treated fracture cases due to lockdown measures.

We observed that male to female ratio (1:1.5) was the same for both the lockdown and non-lockdown groups. This ratio was not affected by the lockdown as the ratio difference was statistically insignificant.

## 5. DISCUSSION

In response to COVID 19 pandemic, the Jordanian government-imposed national level quarantine and lockdown with movement restriction except for the eligible sectors. Elective surgeries were stopped to decrease the risk of viral spread and maintain beds available for patients with COVID-19 infection if the number increases. However, the services for emergency and trauma cases were continued.

Because of these governmental regulations, Surgically

treated trauma cases showed a significant decrease compared to the same period from the year before. Additionally, there was a decrease in polytrauma patients and road traffic accident cases presented to the emergency departments. On the other hand, trauma cases caused by simple falling became a common cause to visit the emergency departments.

Our study showed that country-wide lockdown and new regulations affected the trauma flow by decreasing the total number of trauma patients who attended emergency departments. On the other hand, there was a significant increase in the number of geriatric patients who presented to the emergency department with hip fractures due to simple falls during the lockdown period compared to the previous year. The increased incidence of hip fractures among geriatric age groups during this pandemic might be explained by the inability of young family members to reach those elderly dependent patients and help them do their daily activities and checking their compliance with medication. Adding to that, social distancing and the fear of transmitting the infection to this group of people might have left them alone for a more extended period, which increased their dependence to fulfill their needs, which, in turn, increased the risk of falling and related injuries.

Understanding these changes in trauma patterns during the pandemic is vital to establish policies that might help decrease geriatric hip fractures during any future pandemic or if more waves of the current pandemic continue to occur.

Our literature review for studies from different countries showed that the number of geriatric hip fractures remained the same during the pandemic (7-12). However, a study from Scotland showed a proportional increase in the number of elderly patients who required surgery during the pandemic (13). We could not find any related article that discussed this issue in Jordan; however, some papers showed increased household injuries.

Our study has some limitations. First, it is a retrospective study, and second that it is based on surgically treated fractures that may not represent the exact number of trauma patients.

## 6. CONCLUSION

Pandemics and associated governmental measures could affect the trauma demography. The incidence of geriatric hip fractures, a serious injury with high complications, increased significantly during the lockdown period. These findings should alert decision-makers to adopt policies and measures that ensure geriatric population safety and available care to decrease the incidence of trauma-related morbidity and mortality. Simultaneously, these policies should limit the spread of the COVID-19 infection among this vulnerable population. Examples of these measures are facilitating care providers access, education program about falling precautions on different media, encouraging patients to take anti-osteoporotic medications, and educating patients and care providers about measures to decrease virus spread.

• **Ethics approval:** The Royal Medical Services ethical committee approved this study.

• **Authors' contributions:** All authors have contributed to the study conception, design, material preparation, data collection, analysis, and manuscript writing.

• **Conflict of interest:** The authors have no conflicts of interest to declare relevant to this article's content.

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