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Research Article

The Impact of Covid-19 Pandemic on the Epidemiological Pattern of Fracture Clinic Attendances

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Abstract

Purpose: The Covid 19 pandemic has had enormous impacts on healthcare and orthopaedic services globally. The aim of our study was to assess the impact that the covid 19 pandemic has had on the epidemiological pattern of outpatient fractures clinic attendances.

Methods: An observational retrospective study was performed looking at epidemiology of fractures seen at our fracture clinics during a three-month period of level 5 restrictions of the covid 19 pandemic and the equivalent period pre pandemic. Data pertaining to demographics, aetiology and fracture types are presented.

Results: Patient attendances decreased from 117 in the 'non-covid era' to 77 in the 'covid era' with a total of 109 and 77 fractures identified respectively. Patients were mostly female with a median age of 55. National lockdown measures impacted the mechanism of injury with expected decreases in sporting injuries. The most common fracture types involved the carpus and hand, foot and ankle and malleoli with the proportion of distal forearm fractures increasing in the covid era.

Conclusion: Fracture clinic presentations decreased during the covid era with a higher proportion of fragility fractures. This data may raise awareness regarding the effect of lockdown on an orthopaedic outpatient service for resource allocation for potential future waves.

Keywords: Covid 19; Trauma; Fracture; Epidemiology; Injury; Lockdown

Introduction

The World Health Organization on the 11th March 2020 declared the novel coronavirus first reported in late 2019 in Wuhan, China a global pandemic [1,2]. The virus now known as Covid-19 spread rapidly with vast impacts on society, economies and healthcare delivery. The first case of Covid-19 was reported in the Republic of Ireland on 29/02/2020 [3] with the first death on the 11/03/2020 [4]. Drastic public health measures were adopted globally to curb the spread and on the 12/03/2020 the Irish Government imposed a national lockdown initially closing schools, colleges and social gathering [5] and subsequently all nonessential businesses. A level 1-5 tier system of restrictions was adopted by the Irish Government with level 5 involving the closure of schools, nonessential businesses, and restrictions in travel to 5km from home with no indoor visits allowed or sporting events permitted.

These national lockdowns have resulted in fundamental shifts to the daily routines of society and as such an expected impact upon trauma and injury patterns. The ROI has 26 hospitals which receive trauma, 16 of which have a Trauma and Orthopaedic Department [6]. Trauma comprises a significant burden to healthcare systems and it is estimated to cost the EU member states in excess of 80 billion euro a year [7]. There have been various studies focusing on the impact of covid-19 on trauma units internationally [8-13]. However to the best of our knowledge, there is no data pertaining to the epidemiological pattern of trauma presenting to an outpatient orthopaedic service in Ireland. St. Michael's Hospital, the site in which this study was undertaken is an acute general hospital, part of the St. Vincent's Healthcare Group. It provides a range of specialized clinical services to the people of South Dublin and Wicklow in Ireland. The Emergency Department is opened 8am - 8pm, 7 days a week and is the source of referral to our fracture clinics.

There has been extensive organizational rearrangement to outpatient orthopaedic services during the pandemic. Virtual fracture clinics have been implemented to great success in a number of institutions previously within the ROI [14,15] and played an important role to maintain a safe and effective orthopaedic service during the covid-19 pandemic [16]. In this study however, we hope to better understand the epidemiological shift of fracture patterns presenting to our fracture clinics by comparing the covid-19 era with level 5 restrictions to the equivalent era last year in order to assist with future planning for further waves and pandemics.

Methods

An observational retrospective descriptive study was performed from prospectively collected data. It is a retrospective analysis of Emergency Department referrals to our fracture clinics from 06/01/21 - 11/03/21 during level 5 restrictions which we will refer to as the 'covid era'. Data regarding fracture types, mechanism of injury and demographics are presented. Fragility fractures were identified and defined as a fracture associated with a fall from standing height or less in patients over 50 years. This data is compared to an equivalent

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Table 1: Demographics and mechanism of injury.

	Total	Non-COVID	COVID	P value
n	194	117 (60.3%)	77 (39.7%)	
Age	55 (36.75-73.25)	54 (30-73)	58 (39.5-74)	0.372
Sex				0.05
Male	75 (38.7%)	52 (44.4%)	23 (29.9%)	
Female	119 (61.3%)	65 (55.6%)	54 (70.1%)	
Mofl				0.001
Cycling	13 (6.7%)	7 (6%)	6 (7.8%)	
Direct blow	26 (13.4%)	12 (10.3%)	14 (18.2%)	
Fall walking	132 (68%)	77 (65.8%)	55 (71.4%)	
Sport	18 (9.3%)	18 (15.4%)	0 (0%)	
Other	5 (2.6%)	3 (2.6%)	2 (2.6%)	

period in 2020 from 06/01/20 - 11/03/20 referred to as the 'non covid era'.

Data are reported as N (%), with p values from Fisher's exact tests or as median (interquartile range), with p values from Mann-Whitney U test. P value <0.05 is considered significant.

Results

Table 1 reveals the demographic characteristics of fracture clinic presentations between the covid and non-covid era. Patient numbers were higher in the non-covid era with 117 total patient attendances and 109 fractures (93.2%). There were 3 shoulder and 1 patella dislocation with 1 AC joint injury and 3 soft tissue injuries. The three most common fracture types were carpus and hand, foot and ankle and malleoli in order of prevalence.

There were 77 total patients in the covid era with 70 fractures identified (90.9%). There were three shoulder dislocations and one Achilles tendon rupture with three patients with soft tissue injuries. The three most common fracture types were foot and ankle, distal forearm and carpus and hand in order of prevalence.

Fragility fractures as a percentage of total fractures involving the distal radius were identified in 4.3% in the non-covid era and 14.5% in the covid era. Similarly, fragility fractures of the proximal humerus showed an increase from 4.7% to 6.6%.

Figure 1 displays the different mechanisms of injury between males and females in the non-covid and covid era.

Figure 2 compares the fracture locations from the non-covid and covid era.

Discussion

This study most notably has revealed an expected decrease in the number of trauma referrals to our outpatient orthopaedic service, a decrease of 34.2%. This is invariably a result of the strict lockdown measures imposed in an attempt to curb the spread of covid-19. By mandating people to stay at home, it forced the public to engage in a more sedentary lifestyle with a subsequent lower risk of accidents. The reduction in service requirements during the covid era may also be explained by an understandable fear among the public of visiting hospitals in case of contracting the virus. Similar trends have been observed in other countries during national lockdowns [17].

The mechanism of injuries similarly revealed expected decreases in activities impacted by national lockdown measures. With the closure of sporting facilities and a ban on team sports, there was an expected reduction in sporting injuries. The percentage of male patients as a percentage of total presentations also decreased from 44.4% in the non-covid to 29.9% in the covid era. This is likely due to males being more involved in activities impacted by lockdown measures. Similarly, injuries as a result of direct blows increased during the covid era and could be explained by the increase in time spent at home. These primarily involved accidents such as 'stubbed toes' in our study. A New Zealand and UK study has also noted an increase in trauma presentations from home with declining incidence outside the house during covid 19 [18].

The elderly is at greatest risk of severe covid 19 infections [20]. While home quarantine measures have undoubtedly saved many lives, it has invariably resulted in significant isolation for the elderly with the associated impact upon their general wellbeing and health.

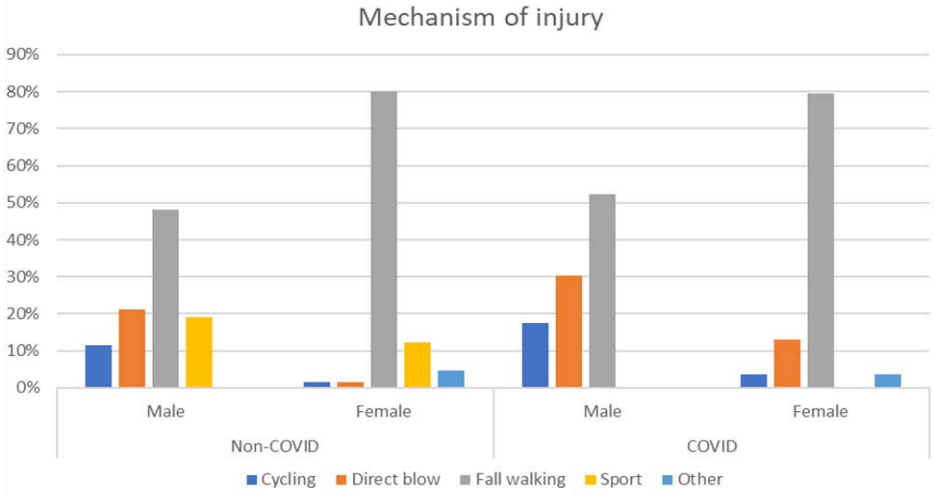

Figure 1: Graph comparing different mechanisms of injury between sexes in the non-covid and covid era.

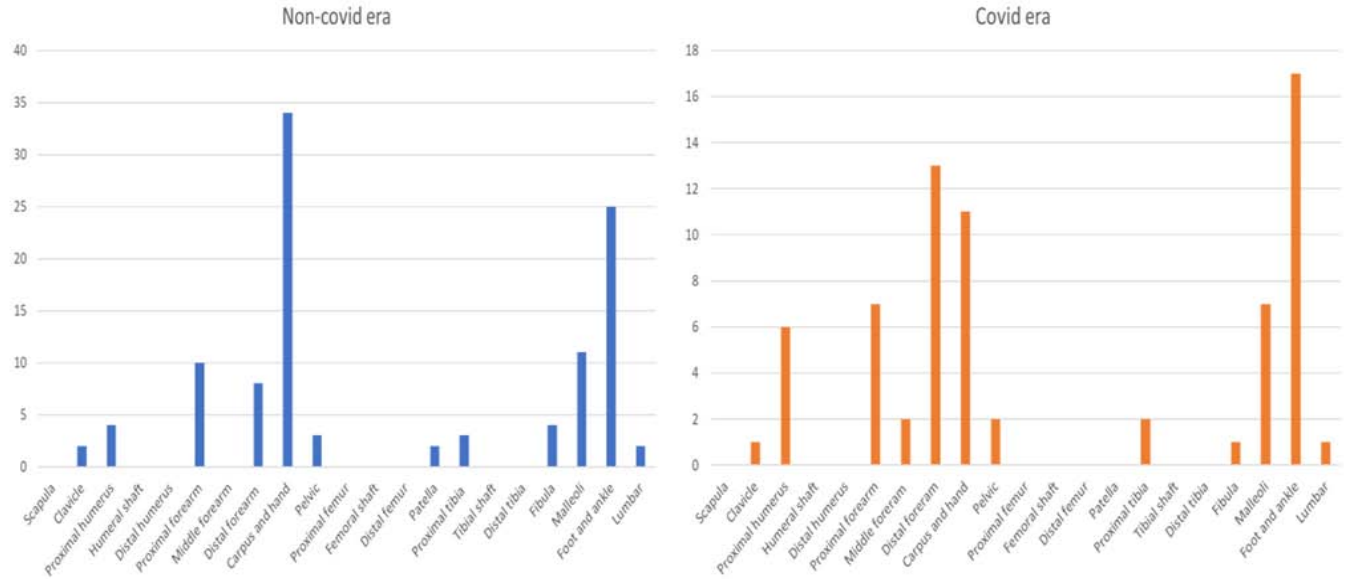

Figure 2: Frequency charts comparing location of fractures from non-covid era (left) and covid era (right).

Falls is a major problem for older people. One in three patients in Ireland will sustain a fall per year over the age of 65 and these increases to one in two over the age of 80 [20]. Our study revealed an increase in fragility fractures from the non-covid to covid era. These fractures carry with them significant morbidity and mortality for patients as well as significant impacts on our health service with falls accounting for 5.2% of the 1.8 million bed days used by older people [20]. Falls prevention requires a comprehensive risk factor assessment and risk factor modifications. The covid 19 pandemic significantly impacted this multifactorial risk assessment with older persons confined to their homes and cancellation of outpatient GP, physio or occupational therapy appointments as well as home visits. Similarly confining older persons to their home will invariably impact upon their daily exercise and the associated impact on muscle tone and balance [21]. The covid 19 pandemic and level 5 restrictions place older persons at risk of deconditioning and will therefore predispose to fragility fractures which was apparent in our study.

Regarding the other fracture locations, foot and ankle and those involving the carpus and hand were in the top three across both time periods. Notably fractures involving the carpus and hand decreased from 31.2% to 15.7% of total fractures from the non-covid to covid era. This again could be explained by the impact of lockdown and the fact that people were engaged in less risky behaviours outside the home.

The limitation of this study is its retrospective observational design and the fact it was confined to a single centre. Multi centre studies would provide a clearer picture of the prevalence and varied fracture patterns presenting to fracture clinics pre and post national lockdown measures. The strength of this study is the fact it is the first in Ireland to the best of our knowledge to analyze the epidemiological pattern of fractures during the covid 19 pandemic.

Conclusion

The Covid-19 pandemic has had an enormous impact on our healthcare system and society as a whole. The effect on trauma and orthopaedic surgery has been seen worldwide with widespread cancellations of outpatient clinics and elective surgeries. There was a similar decrease in overall patient numbers referred to our fracture clinics. This important information is relevant to potential future waves or pandemics when allocating scarce resources including staff redeployment. This study also highlights the importance of falls prevention strategies and public education regarding bone health for those isolated at home during potential future lockdowns.

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