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Hand injuries during COVID-19: Lessons from lockdown

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Summary The two-month nationwide lockdown implemented in Australia in response to COVID-19 involved restrictions on social gatherings and non-essential services, resulting in marked changes to the distribution of time spent at home and in the workplace. Given the likelihood of future lockdowns, this study aimed to investigate whether the lockdown was associated with an alteration in the pattern of acute hand injuries admitted to Sydney Hospital Hand Unit relative to the same period in 2019, and whether target areas for preventative strategies could be identified.

During the lockdown period in 2020, 332 acute presentations were noted, and in the same period in 2019, 310 cases were noted. The mean patient age was higher in 2020, largely due to a 327% increase in do-it-yourself (DIY) injuries. Workplace injuries increased in 2020 despite a 9.5% reduction in hours-worked, reflecting a redistribution of workers into manual labour jobs with a higher risk for hand injuries. Patients who suffered low-energy injuries at work were also significantly younger in 2020, suggesting this effect was most pronounced in younger age-groups, probably due to the shutdown of hospitality-based industries. Domestic violence-related injuries increased in 2020, highlighting the need to maintain resources to provide support in such cases at subspecialty hand units, which are often largely outpatient-centred. This study, therefore, identified a number of key areas that could be targeted in the event of future lockdowns, including messages regarding safe DIY activities, and more stringent requirements regarding worksite briefing and safety for people commencing labour-based jobs, especially if transferring from another industry.

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Introduction

Following the declaration by the World Health Organisation (WHO) that COVID-19 could be characterised as a global pandemic, Australia implemented a ban on the arrival of all non-residents and non-Australian citizens from March 20. A further nationwide shutdown on all non-essential services was implemented from midday March 23, with the closure of places of social gathering, including clubs, entertainment venues and eat-in restaurants, as well as social distancing guidelines. These restrictions remained in place until May 15, when limitations were relaxed to allow gatherings of 10 people, the re-opening of cafes and restaurants for sit-in dining and the return to work for many non-essential industries.

The intervening 2-month shutdown necessitated a marked change in the time spent at home versus in the workplace as industries classified as non-essential transitioned to work-from-home policies, or closed entirely. A number of recent studies have noted a resultant alteration in the distribution of presentations for acute hand and orthopaedic trauma, with an increase in certain injury types such as do-it-yourself (DIY) injuries.^{1,2} Hand trauma, in particular, produces significant direct and indirect healthcare costs owing to the ubiquity of the use of the hand in activities of daily living and vocation, making it an ideal target for preventative strategies to preserve increasingly scarce healthcare resources.³⁻⁵

Given the possibility of future lockdowns related to COVID-19, this study aimed to analyse the change in the pattern of acute hand injuries during the COVID-19 shutdown period, and identify specific targets for preventative strategies during the ongoing pandemic.

Method

This study is a retrospective analysis of inpatient data for patients who were admitted under the hand surgery department at Sydney Hospital following acute presentations between March 23 and May 15 in 2019 and 2020. Sydney Hospital is the tertiary referral centre for hand injuries for the South Eastern Sydney Local Health District (SESLHD) and Illawarra Shoalhaven Local Health Districts, and receives patients from the entire South Coast of New South Wales. Acute hand injuries from an adjacent hospital, Prince of Wales Hospital (POWH), were also redirected to Sydney Hospital during the lockdown period as part of a redistribution of services designed to expand capacity for potential COVID-19-related admissions.

Ethics approval for the study was obtained from the SESLHD Human Research and Ethics low-negligible risk committee. Charts were reviewed for patient demographics, reason for admission, location of injury (workplace vs. non-workplace), injury characteristics (mechanism and type of injury), management type (operative vs. non-operative), and length of stay. Workplace injuries were defined as those that were incurred during the course of paid employment and were sub-divided into high-energy machine-related injuries, and low-energy non-machine-related injuries. Mechanisms of injury were grouped into ten categories

Table 1 Baseline demographic and management data.

	2019	2020	p-value
Patient number	310	332	
Age (mean; SD)	39 (17)	42 (18)	0.013
Sex (Female;%)	91 (29.4)	100 (30.1)	0.83
Workplace (%)	63 (20.3)	88 (26.5)	0.048
Operation (%)	298 (96.1)	322 (97)	0.54
LOS (days; mean)	0.8	0.9	0.26

*Statistically significant results in bold.

(DIY, animal bite, kitchen, domestic violence, workplace, fall, punch, sport, minor non-specific, and unknown) that were prospectively determined on the basis of previously publications on hand injury epidemiology.⁶⁻⁸ Patients who underwent day-only procedures were classified as inpatients for the duration of their stay and so were included in the analysis, as were those who presented within the designated period and then discharged before undergoing their operation on a semi-elective basis (such as closed fractures). Patients who underwent elective operations or revision procedures for injuries sustained prior to the designated periods were excluded.

Comparisons of baseline data between years for age and length of stay were completed using a simple T-test analysis. Chi-square tests were used for the remainder of the analyses in order to account for the categorical nature of the variables, with the differences in distribution among groups compared between years. All analyses were performed using IBM SPSS v.24, with a statistical significance level of 0.05.

Results

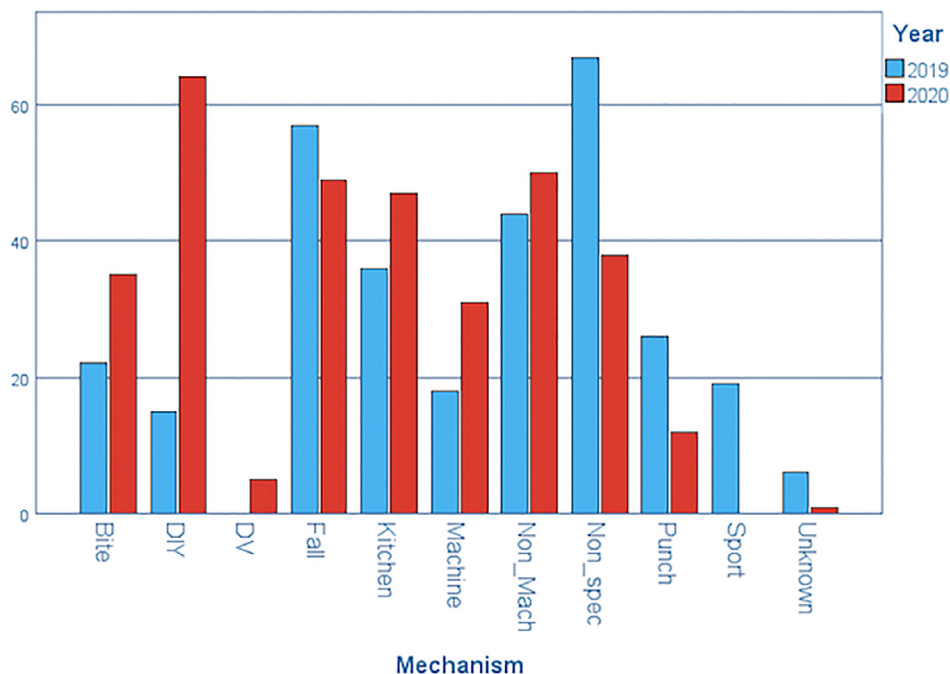
A total of 332 acute presentations requiring admission were identified during the lockdown period between March 15 and May 15 2020, and 310 cases were identified for the same period in 2019. Baseline demographic and treatment data were available for all 642 patients, and are presented by year in [Table 1](#). The mean patient age was higher in 2020 than in 2019 (42 and 39, respectively), as was the proportion of injuries that occurred in the workplace (26.5% and 20.3%). No difference was identified between 2020 and 2019 with regard to patient sex, length of stay, or management type - overall the majority of patients were male (70.2%), underwent operative management (97%), and were managed as day-only cases (mean LOS 0.8).

A greater proportion of presentations were related to DIY injuries during the lockdown period than in the comparable period in 2019, with 64 cases recorded in 2020 and 15 in 2019, representing a 327% increase ([Table 2](#); [Figure 1](#)). The majority of DIY injuries in both years occurred in males (82.5% and 73.3%) in the 44-49-year-old age range. Injuries in the workplace were also predominantly in males, though in a younger population group, and the mean age of patients injured in non-machine related workplace incidents decreased between 2019 and 2020 (39 and 32, respectively).

Table 2 Distribution of presentations by mechanism of injury in 2019 and 2020.

Mechanism	2019			2020		
	No.	Age (SD)	Sex (Female;%)	No.	Age (SD)	Sex (Female;%)
DIY	15	44 (21)	4 (26.7)	64	49 (17)	12 (17.5)
Dog/cat bite	22	55 (19)	15 (68.2)	35	48 (18)	22 (62.9)
Kitchen	36	39 (15)	17 (47.2)	47	38 (15)	23 (57.5)
Domestic violence	0	NA	NA	5	43 (16)	2 (40)
Workplace machine	18	39 (16)	0 (0)	31	36 (17)	2 (4.1)
Workplace non-machine	44	39 (11)	3 (6.8)	50	32 (12)	6 (12)
Fall	57	43 (22)	17 (29.8)	49	46 (20)	20 (40.8)
Punch	26	25 (7)	1 (3.8)	12	34(10)	1 (8.3)
Non-specific	67	38 (16)	24 (35.8)	38	46 (19)	12 (31.6)
Unknown	6	29 (9.7)	1 (16.7)	1	50 (NA)	0 (0)
Sport	19	24 (5)	9 (47.4)	0	NA	NA

*Statistically significant results in bold.

**Figure 1** Presentations by mechanism of injury in 2019 and 2020.

Injuries related to domestic violence increased, with five cases recorded in 2020 and zero in 2019, though there was no difference with respect to sex.

The proportion of presentations related to punches and sport decreased in 2020 (by 54% and 100% respectively). Punch injuries had a significant male predominance in both years (96.2% and 91.7%), but there were no differences with respect to sex for sport. Non-specific injury mechanisms also decreased in 2020. No statistically significant differences were identified between 2020 and 2019 in the proportions of injuries related to dog or cat bites, kitchen injuries or falls.

Discussion

The results of this study indicate that the March-May COVID-19 lockdown period in 2020 was associated with a number of changes in the pattern of injuries relative to the same period in 2019. The most striking change was in the number of presentations related to DIY home maintenance injuries, which increased by 327% in 2020, with males in the 45-49-year-age bracket making up the majority of patients - the major contributor to an increase in the overall patient age in 2020. This increase in household DIY injuries is in keeping with the findings from Hampton and Macdonald et al.

and likely related to the increased time spent at home, as well as a potential reluctance to have professional tradespeople visit residences due to the perceived risk of disease transmission.^{1,9}

Despite this, injuries in the workplace increased in 2020, both in absolute terms (88 presentations vs. 63 in 2019) and as a proportion of the overall number of injuries (26.5% vs. 20.3). Although this is seemingly unintuitive, given the fact that the number of hours worked in Australia decreased by 9.5% overall, this finding is potentially reflective of a redistribution of workers into manual labour jobs with a higher risk of hand injuries.¹⁰ Building work continued during the lockdown as it was considered an essential service, leading to a shift to paid manual labour among those who had previously been employed in other industries. Younger demographic groups are likely to have been over-represented in this group due to the shutdown of hospitality and arts industry-based employment in which they have traditionally been employed, with jobs in accommodation and food services decreasing by 40.8% in the 20-29-year age group in March and April 2020.¹¹ Our findings support this, as patients who sustained low-energy injuries at work were significantly younger in 2020 (32 vs. 39) than in 2019. This indicates that younger people, likely in short-term jobs, demonstrate a greater propensity to be injured at the worksite, and highlights the need for appropriate worksite training for workers prior to commencement of manual labour-based jobs.

The finding that injuries related to domestic violence increased during the lockdown period is in keeping with a number of other recent publications, and is reflective of the need to be aware of the possibility of non-accidental injury, and to maintain resources to provide appropriate support in such cases at subspecialty hand units, which are often largely outpatient-centred.^{12,13}

The reduction in sport-related injuries is in keeping with expectations, given the complete shutdown of organised sporting activities. The decrease in punch-related presentations is likely to be a result of a reduction in interpersonal violence. Although Sydney did not have the formal curfew implemented in other cities, all bars, nightclubs, and large gatherings were closed, with a commensurate reduction in alcohol-related violence. The lower number of injuries related to minor 'non-specific' aetiologies in 2020 is likely to be reflective of the overall decrease in presentations to the emergency department for minor injuries that has been reported during the COVID-19 pandemic.¹⁴ The absolute numbers of dog/cat bites and kitchen-related injuries were higher in 2020 (35 vs. 22 and 47 vs. 36), as would be expected, given the increased time spent at home with pets and cooking, but the differences did not reach statistical significance.

This study had a number of limitations. The most pertinent is related to the retrospective nature of the study and the inherent limitations that come with sourcing data from clinical notes. The exact nature of the mechanism of injury could occasionally not be identified, although every effort was made to address this, including retrieving ambulance records or off-site paper files. Specific details that would provide useful information in the context of our findings, such as the length of time that a patient had worked for their employer, were obviously not recorded. Future studies on hand trauma should prospectively record data related to

the length of time in employment prior to injury, as well as the scope of worksite training or initiation. Another limitation relates to the fact that hand injuries from an adjacent hospital (POWH) were re-directed to Sydney Hospital during the COVID-19 lockdown. Although this increased the overall number of presentations slightly, it is unlikely to have significantly affected the pattern of presentations, given the relatively small number of patients transferred, and the fact that POWH is within the same local health district and so shares a similar patient population.

This study therefore showed that the distribution of acute hand injuries during the COVID-19 lockdown period was reflective of changes in the pattern of activities undertaken both at home and in the workplace, particularly by people operating outside their usual scope of employment. A number of key areas that could be targeted in the event of future lockdowns include messages regarding safe DIY activities (or the availability of professional tradespeople in a COVID-safe manner), and specific requirements regarding worksite briefing and safety for people commencing labour-based jobs, especially if transferring from another industry.

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