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Original article

Hand injuries treated at a hand emergency center during the COVID-19 lockdown



Épidémiologie des traumatismes de la main dans un centre SOS-mains pendant le confinement dû au COVID-19

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ABSTRACT

The recent coronavirus outbreak has tested the adaptability, cooperation and organizational capabilities of our healthcare systems. Restrictions were implemented in several countries to reduce virus transmission whilst emergency departments (ED) were overwhelmed and there was shortage of healthcare providers. Given this situation and the consequences of hand injuries, we studied the epidemiology of hand injuries in an accredited FESSH emergency center during the lockdown in France (March 17 to May 10, 2020) due to the coronavirus outbreak. During this period, 1947 patients consulted for a hand injury. We found high percentages of men (63%), open wounds (70%), domestic accidents (88%) and surgical treatment being required (76%). There was a significant decrease in admissions and consultations relative to the same period in 2019. This reference data can help healthcare systems prepare for future outbreaks and similar restrictions.

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R É S U M É

La récente pandémie de coronavirus a mis à l'épreuve l'adaptabilité, les capacités de coopération et d'organisation de nos systèmes de santé. Plusieurs pays ont fixé des restrictions pour réduire la transmission du virus alors que les services d'urgence étaient débordés et qu'il y avait une pénurie de personnel soignant. Compte tenu de cette situation et des conséquences des traumatismes de la main, nous présentons l'épidémiologie des urgences de la main dans un centre d'urgence SOS-mains pendant le confinement national en France. Ces données donnent des valeurs de référence qui peuvent aider à organiser les services d'urgence en cas de futures pandémies et des confinements similaires, car ils sont susceptibles de se reproduire dans un futur proche. Au cours de cette période, 1947 patients ont consulté pour un traumatisme de la main. Nous avons trouvé des pourcentages élevés d'hommes (63 %), des plaies (70 %), des lésions domestiques (88 %) et de lésions nécessitant un traitement chirurgical (76 %). Les données ont été comparées à l'épidémiologie au cours de la même période en 2019.

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Introduction

The recent coronavirus outbreak has forced societies, healthcare systems and public health policies into situations that have tested our adaptability, cooperation and organizational capabilities [1–4]. Restrictions were implemented for citizens and

healthcare providers to reduce virus transmission which required us to adapt our personal and professional habits. Considering this extraordinary situation and the personal and economic consequences of hand injuries, an epidemiological description of the patients who suffered hand injuries during this crisis is essential to helping healthcare systems prepare for future outbreaks and similar restrictions [5,6]. Hand injuries are of particular interest as they account for up to 29% of all injuries treated at hospitals [7]. We present an epidemiological study of hand injuries during the

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COVID-19 pandemic in a hand emergency department (ED) in France.

Patients and methods

A retrospective, cross-sectional analysis was performed on records of patients who consulted at a hand ED during the French lockdown between March 17 and May 10, 2020. Data collection started on March 18 and ended on May 10, 2020. Data from 1947 patients were retrieved and anonymized by an independent examiner. Patients who consulted for chronic conditions were excluded. Analyzed data included demographics, context of injury, type of lesion and treatments. Data were compared to the data during the same period in 2019. Results are presented as mean or percentage with standard deviation (SD) and 95% confidence interval (CI) measured by the modified Wald method. Analyzed data between 2019 and 2020 were compared with a Chi-square test.

Results

Most of the 1947 patients that consulted were males (63%; 95% CI 61–65%). The most frequent lesions were open wounds with an incidence of 705.2 per 1000 patients (71%, 95% CI 68–73%). The mean age of the population was 39 years (SD: 19.9 years, range: 1–97, 95% CI 38–40%). The most frequent context was a domestic accident (90%, 95% CI 89–91%) and 77% of patients required surgery (95% CI, 75–78%). There was an average of 1.2 lesions/patient. Three hundred forty-one patients had two lesions and 39 patients had three lesions. The remaining 1567 patients had single lesions.

There were fewer consultations during the lockdown period than during the same period in 2019 ($p = 0.0006$). Patient demographics, injury characteristics and treatments are detailed in [Tables 1 and 2](#).

Discussion

This study characterizes the population of patients who suffered hand injuries during the lockdown associated with the COVID-19 pandemic in France. The seriousness of hand trauma lies in their functional and economic burden. Hand injuries are the most expensive injury type (\$740 million per year) and represent 29% of all unintentional injuries seen in the ED [5–7].

Three studies have described the population of patients treated for hand accidents during the COVID-19 pandemic [1,3,4]. In our study, we found that domestic accidents were responsible for 88% of the hand injuries whilst only 10% of the injuries were work-related. In normal times, two-thirds of hand injuries occur at home and one-third at work [8]. This underlines the importance of national campaigns for preventing hand injuries that have been previously proposed and need to be reinforced, particularly during lockdowns where people are confined at home [8]. The measures established in response to the COVID-19 pandemic in ED and surgical units required adaptation of the spaces, operating rooms, waiting areas, wards and emergency rooms which highly impacted the organization of the centers and their reception capacities [3,4,9]. A reduction in the number of hand injuries would relieve the pressure on hand ED as there are shortages of caregivers and materials during this kind of crisis [9].

Lockdown periods induce a change in population habits and behavior [10]. Hand injury prevention awareness should therefore

Table 1
Overall demographics, injury characteristics and treatment of patients who consulted for a hand injury during the national lockdown in France due to the COVID-19 pandemic. CI: confidence interval; SD: standard error.

	Total			
	n	%	(95%CI)	SD%
Gender				
Male	1225	62.9	60.2–65.6	48.3
Female	722	37.1	33.6–40.6	48.3
Age (years)				
0–5	68	3.5	–0.9–7.9	18.4
6–15	156	8.0	3.7–12.3	27.2
16–25	281	14.5	10.3–18.6	35.2
26–65	1223	62.8	60.1–65.6	48.3
>65	219	11.2	7.1–15.4	31.5
Lesions				
Open wound	1373	70.5	68.0–73.0	47.3
Laceration	1298	66.6	64.1–69.2	47.2
Nail lesion	23	1.2	–3.2–5.6	10.8
Foreign body	143	7.3	3.1–11.6	26.1
Amputation	43	2.2	–2.2–6.6	14.7
Fracture	344	17.7	13.6–21.7	38.2
Closed	200	10.3	6.1–14.5	30.4
Open	144	7.4	3.1–11.7	26.2
Infection	417	21.4	17.5–25.4	41.0
Closed trauma	213	10.9	6.7–15.1	31.2
Sprain	54	2.8	–1.6–7.1	16.4
Dislocation	21	1.1	–3.3–5.5	10.3
Contusion	123	6.3	2.0–10.6	24.3
Tendon avulsion	15	0.7	–3.6–5.2	8.7
Surgical complications	62	3.1	–1.1–7.6	17.6
Context				
Work-related	195	10.0	5.8–14.2	30.0
Domestic accident	1724	88.5	87.0–90.0	31.9
Self-inflicted	5	0.3	–4.2–4.7	5.1
Violence	18	0.9	–3.5–5.3	9.6
Road accident	5	0.3	–4.1–4.7	5.5
Treatment				
Non operative	457	23.5	19.6–27.3	42.4
Operative	1490	76.5	74.4–78.7	42.4

Table 2

Epidemiology of hand injuries during the French lockdown of 2020 compared to the same period in 2019. CI: confidence interval; SD: standard error.

	2019		2020		Δ	$\Delta\%$	<i>p</i>	95% IC
	<i>n</i>	%	<i>n</i>	%				
Admissions	3455		1947		–1508	–44	0.034	[–1026.8; 2534.8]
March	878	25	507	26	–371	–42		
April	1854	54	1127	58	–727	–39		
May	723	21	313	16	–410	–57		
Consultations	1265		457		–808	–64	0.0006	[–601.3; 878.3]
March	317	25	110	24	–207	–65		
April	677	54	287	63	–390	–58		
May	271	21	60	13	–211	–78		
Surgery	2190		1490		–700	–32	0.20	[–917.1; 1544.1]
March	561	26	372	25	–189	–34		
April	1177	54	730	49	–447	–38		
May	452	21	238	16	–214	–47		
Sex of patient	3455		1947		–1508	–44	0.24	[–1033.3; 3043.9]
Male	2221	64	1225	63	–996	–45		
Female	1234	36	722	37	–512	–41		
Age	3455		1947		–1508	–44	0.38	[–742.9; 1748.2]
1–19	791	23	323	17	–468	–59		
20–39	1214	35	670	34	–544	–45		
40–59	921	27	573	29	–348	–38		
60–79	439	13	312	16	–127	–29		
>80	90	3	69	3	–21	–23		

be reinforced during such periods to avoid direct consequences and overwhelming the ED [9]. Based on our findings, middle-aged males should be educated about the risk of hand wounds as they are at the highest risk of requiring surgical treatment during lockdown periods or pandemics.

Our study has some limitations. Although we described the epidemiology of the population during the lockdown and we compared these data to those from the previous year, we did not have access to the exact details of the injuries during 2019, which would have provided us with better insight. Moreover, the data collection took place during the lockdown period; it is likely that some patients may have waited until after the end of the lockdown to consult for their hand injuries as they might have been deterred from visiting EDs during this period. In fact, while we submitted this manuscript, we were receiving patients with severe infections and missed diagnoses, which can be explained by the lockdown measures and patients' unwillingness to visit the ED and use valuable resources. Finally, the end of the lockdown does not mean that we have returned to normal. There might be an epidemiological shift given that partial social distancing measures and work restrictions remain.

This study increases awareness of hand injury prevention during lockdown periods. Particularly, the high rates of domestic accidents during pandemics should alert the governments and decision-makers to increase the prevention of domestic hand trauma as they cause significant personal and social consequences during these difficult periods [8].

Conflict of interests

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical approval

The study is in accordance with the ethical standards of the institutional ethics committee and with the 1964 Helsinki declaration and its later amendments.

Contributorship

CC wrote the manuscript and supervised it.

IR and BL collected the data.

PB gave important feedback and motivated the work.

FAL validated the work.

YB helped with conceptualization.

All authors reviewed and edited the manuscript and approved the final version of the manuscript.

References

- [1] Pichard R, Kopel L, Lejeune Q, Masmoudi R, Masmajeun EH. Impact of the Coronavirus Disease 2019 lockdown on hand and upper limb emergencies: experience of a referred university trauma hand centre in Paris, France. *Int Orthop* 2020;44:1497–501.
- [2] Gostin LO, Wiley LF. Governmental public health powers during the COVID-19 pandemic: stay-at-home orders, business closures, and travel restrictions. *JAMA* 2020;323:2137–8.
- [3] Ducournau F, Arianni M, Awwad S, Baur EM, Beaulieu JY, et al. COVID-19: initial experience of an international group of hand surgeons. *Hand Surg Rehabil* 2020;39:159–66.
- [4] Facchin F, Messana F, Sonda R, Faccio D, Tiengo C, Bassetto F. COVID-19: initial experience of hand surgeons in Northern Italy. *Hand Surg Rehabil* 2020;39.
- [5] de Putter CE, Selles RW, Polinder S, Panneman MJM, Hovius SER, van Beeck EF. Economic impact of hand and wrist injuries: health-care costs and productivity costs in a population-based study. *J Bone Joint Surg Am* 2012;94:e56–61.
- [6] Fontanarosa PB, Bauchner H. COVID-19-looking beyond tomorrow for health care and society. *JAMA* 2020;323:1907–8.
- [7] Larsen CF, Mulder S, Johansen AMT, Stam C. The epidemiology of hand injuries in the Netherlands and Denmark. *Eur J Epidemiol* 2004;19:323–7.
- [8] Bellemere P, Guimberteau JC. Experience of a national campaign for hand trauma prevention in France. *Handchir Mikrochir Plast Chir* 2013;45:335–8.
- [9] Mareiniss DP. The impending storm: COVID-19, pandemics and our overwhelmed emergency departments. *Am J Emerg Med* 2020;38:1293–4.
- [10] Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet* 2020;14(395):912–20.