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Letter to the Editor

COVID-19 and impact on trauma injuries. A Janus facing in opposite directions?



Dear Editor,

We have read with great interest leading articles published in *Injury*, about reduction in trauma cases during the pandemic [1]. Herein, we report our experience from the largest and busiest hospital in Greece, covering a population that exceeds 3 million people. Despite the fact that our data is in agreement with the aforementioned study, in terms of reduced emergency surgery cases during the pandemic, the only observation, that differentiates our results, is that we have noticed a statistically significant upsurge in penetrating trauma injuries (gunshot wounds, stab wounds), while blunt and total trauma cases declined. The multifaceted nature of the virus and its impact in many different aspects of our lives have probably variable consequences between different countries and trauma centers. However, we believe that our findings might be a valuable addition in traumatology during this era, that must be appreciated by future larger studies.

There were 1433 trauma patients during the lockdown period in 2020 and 1895 trauma patients in same calendar periods in 2019 (Table 1). The epidemiological characteristics in the two study periods showed differences in age and sex, with younger and male patients predominating ($p < 0.05$). Strikingly enough, while car accident-related injuries decreased as well as minor injuries, there was a clear trend of exponential increase in the percentage of patients presenting with gunshot wound (0.9% vs 1.9, $p < 0.05$) and stab injuries (0.7% vs 2.5%, $p < 0.05$), between pre-COVID and COVID periods, respectively. Against our efforts to enhance ICU capacity for infected COVID- cases, ICU admission rates for this type of injuries increased, becoming a serious obstacle for physicians in our hospital, which is considered the largest COVID referral center in Greece. A fact that also needs to be emphasized is the positive testing for substance use in penetrating injury cases, which increased by 31.9%, as well as the number of patients involved with already criminal records identified, according to police data.

It is apparent that although restriction and lockdown measures have affected the total number of trauma cases, with overall reduced injuries, penetrating trauma cases related with criminal attempts have shown incremental growth. The etiology of this observation is probably multifactorial. It seems that the suggested 'stay home and save lives' policies have led to increased alcohol consumption or illegal drugs use; a fact that might have influenced criminal-related trauma cases as reported in previous studies [2]. Furthermore, a growing number of scientific data have raised concerns about increasing number of patients with newly diagnosed mental health problems during this period, or worsening of symptoms of people already affected by mental health illnesses [3]. Interestingly enough, there was an increase of 1.8% in people in-

Table 1

Trauma cases during pre-COVID and COVID-era.

No of patients	Pre-COVID-19 26/2/2019- 26/12/2019	COVID-era 26/02/2020- 26/12/2020	Difference (%)
Total trauma admissions (blunt, penetrating, minor, major)	1895	1433	-32.2
Gunshot wound injuries	17	27	+58.8
Stab wound injuries	13	36	+176.9
Positive testing for substance abuse	323	426	+31.9

involved in penetrating trauma cases, who started taking antidepressant medications after the outbreak. This observation along with accompanied rise in domestic violence cases during the pandemic [4], could possibly explain violence-induced traumatic injuries we have seen in our department.

Among additional factors that might show etiological relationship, with the escalation of penetrating trauma and criminal assaults-related injuries, is the outlaw nature of people with past criminal records, who continue their illegal activities, taking advantage of allocation of the police forces to every day's checks for adaptation of restriction measures [5]. Reduced diligence in social distancing and lockdown measures by this group of people, might be the cause of increased numbers of such cases nowadays. Last but not least, the huge economic crisis associated with the pandemic, with a significant percentage of people unemployed and leaving in poverty, may have led them to get involved in criminal incidents and theft crimes, associated with penetrating trauma injuries [6].

In response to the COVID-19 pandemic, governments around the world have implemented lock-down schemes to contain the health crisis and at the same time enhance hospital ICU capacity. However, while these measures had positive consequences on the overall reduction in trauma cases, there were also negative aspects like the incremental number of injuries related with criminal attempts, like stab wound or gunshot wound injuries. The actual effects of the novel coronavirus not only on health care system, trauma but also on people's everyday life might only be appreciated by future large-scale studies.

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Declaration of Competing Interest

The authors have no conflicts of interest to declare.

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References

- [1] Leichte SW, Rodas EB, Procter L, Bennett J, Schrader R, Aboutanos MB. The influence of a statewide "stay-at-home" order on trauma volume and patterns at a level 1 trauma center in the united states. *Injury* 2020;51:2437–41.
- [2] Jackson SE, Garnett C, Shahab L, Oldham M, Brown J. Association of the COVID-19 lockdown with smoking, drinking and attempts to quit in England: an analysis of 2019–20 data. *Addiction* 2020.
- [3] Pfefferbaum B, North CS. Mental health and the COVID-19 pandemic. *N Engl J Med* 2020;383:510–12.
- [4] Chang YR, Kim KM. Impacts of social distancing during the COVID-19 outbreaks in Korea: level 1 trauma center data of domestic incidents and intentional. *Injury* 2020;11:345–50.
- [5] de la Miyar JRB, Hoehn-Velasco L, Silverio-Murillo A. Druglords don't stay at home: COVID-19 pandemic and crime patterns in Mexico City. *J Crim Justice* 2020:101745.
- [6] Patel JA, Nielsen FBH, Badiani AA, Assi S, Unadkat VA, Patel B, et al. Poverty, inequality and COVID-19: the forgotten vulnerable. *Public Health* 2020;183:110–11.

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