

Impact of Coronavirus Disease-2019 on Orthopedic and Trauma Cases at Sina Hospital, Tehran, Iran: An Experience from a Tertiary Trauma Center

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Abstract

Background: The recent outbreak of the coronavirus disease-2019 (COVID-19) in China has rapidly spread throughout the world and significantly affected orthopedic and trauma cases all over the world. This study aims to evaluate the impact of the COVID-19 pandemic on orthopedic and trauma cases at Sina Hospital, Tehran, Iran.

Methods: The study was conducted using the database of Orthopedics Department at Sina Hospital. It consisted of data before four and after four months of the COVID-19 outbreak. The demographic data of the patients with orthopedic problems and trauma, including sex, age, and type and mechanism of trauma was studied.

Results: In total, data of 1033 patients was studied, including 597 and 436 patients before and after the COVID-19 outbreak, respectively. In this period of time, the portion of patients with laceration and upper limb injuries increased significantly ($P = 0.007$ and $P = 0.002$, respectively). Additionally, the proportion of low energy trauma and high energy trauma respectively increased and decreased ($P = 0.055$).

Conclusion: Because of the outbreak and consequent lockdown in many countries, cases of orthopedics and trauma very significantly reduced. This resulted in less workload on orthopedic surgeons and residents during the COVID-19 pandemic. Decreases in trauma cases and road traffic accidents were also reported by most centers around world.

Keywords: Coronavirus Disease-2019; Outbreak; Orthopedics; Trauma

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Background

The first case of coronavirus disease-2019 (COVID-19) was reported in December 2019 in Wuhan, China (1). On February 19, 2020, first reports of COVID-19 were officially announced in Iran (2). The disease has caused a pandemic and mass hysteria worldwide. As of August 18, 2020, the virus has infected more than 21,756,357 people worldwide including 771,635 deaths (3). Iran was one of the first countries where the COVID-19 outbreak occurred. As of August 18, 2020 there were 345,450 confirmed cases and 19,804 deaths in Iran (4). These numbers are increasing day by day due to the high transmission rate of the disease. Iran is one of the few countries in areas with high trauma cases probably involving road traffic accidents. As per one systemic review, in which a total of 3234481 cases were investigated, the mean age of the cases was 30 (17.4) years. The males comprised 75.70% of all the patients. The most common mechanism of injuries was road traffic accidents (RTAs) (50.10%) followed by falls (22.30%). In RTAs, motorcyclists accounted for the majority of victims (45.00%). Roads were the most common accident scene for the injuries (57.50%) (5).

In most countries, the cases of orthopedics and trauma cases were significantly reduced during the COVID-19 outbreak. Sina University Hospital is the first

Iranian hospital established in 1837 and is one of the high trauma centers in the country.

Methods

Being a high trauma center, Sina Hospital receives multiple trauma and orthopedic cases and services offered at this hospital include spine surgery and trauma, head and neck trauma, pediatric traumatology, limb trauma, and other electives services. We studied and compared the data of orthopedics department before and after the COVID-19 outbreak to investigate the changes during the outbreak. Data of 1033 patients was studied, with 597 and 436 patients belonging to before and after the COVID-19 outbreak, respectively. We compared data of four months before March 15, 2020 and four months after March 15, 2020. Dissection: This step was performed after sedation of the animal by chloroform. The size of the excised sections for EM had to be approximately 2 mm × 2 mm and then put into the fixative solution.

Results

Before March 15, 2020, the mean [standard deviation (SD)] of age of the trauma and orthopedic cases was 38.34 years compared to the 35.21 years after the COVID-19 outbreak.

Table 1. Trend of trauma and orthopedic cases before and during coronavirus disease-2019 (COVID-19)

Variable	Before COVID-19 (n = 597)	After COVID-19 (n = 436)	P-value	
Age [mean ± SD (years)]	38.34 ± 10.29	35.21 ± 9.81	0.431	
Gender [n (%)]	Male	370 (61.98)	0.273	
	Female	227 (38.02)		
Cause [n (%)]	RTA	349 (58.46)	241 (55.27)	0.309
	Falls	158 (26.47)	123 (28.21)	0.571
	Sports	90 (15.08)	72 (16.51)	0.545
Site [n (%)]	Lower limb	343 (57.45)	223 (51.15)	0.044
	Upper limb	175 (29.31)	120 (27.53)	0.529
	Spine	79 (13.23)	93 (21.33)	0.001
Mechanism [n (%)]	Low energy	483 (80.91)	373 (85.55)	0.055
	High energy	114 (19.09)	63 (14.45)	
Laceration [n (%)]	251 (42.04)	263 (60.32)	0.007	

COVID-19: Coronavirus disease-2019; SD: Standard deviation; RTA: Road traffic accident

Before the outbreak, 61.98% of the patients were males and after the outbreak, males remained the dominant proportion contributing to 58.49% of the patients. Besides, RTAs composed of 58.46% of trauma injuries, with falls and sports injuries each causing 26.47% and 15.08% of the injuries, respectively. After the COVID-19 outbreak, RTAs composed of 55.27% of the injuries, while falls and sports injuries each contributed to 28.21% and 16.51% of the cases, respectively. Comparing sites of trauma, lower limb injuries composed of 57.45% of cases before the outbreak which changed to 51.15% after the outbreak. On the other hand, upper limb injuries composed of 29.31% before the outbreak, which changed to 27.53% after the outbreak and other injuries including spine injuries consisted of 13.23% and 21.33% of the cases respectively before and after the outbreak. Low-energy trauma occurred in 483 (80.91%) and 373 (85.55%) patients before and after COVID-19, respectively. 42.04% of the patients referred to the hospital with laceration before COVID-19 while this number increased to 60.32% during the COVID-19 pandemic ($P = 0.007$). Table 1 describes the trend of trauma and orthopedic cases before and during COVID-19.

Discussion

Social distancing policies during COVID-19 showed profound psychological and social consequences. The goal of these policies is to reduce physical interaction of people and therefore limit the progression of the disease. We hypothesized that the COVID-19 pandemic and social distancing policies would have a notable impact on trauma cases in Sina hospital.

The number of high-energy trauma cases was reduced significantly during the COVID-19 pandemic. The enforced social distancing and reductions in all causes of trauma including sports, RTAs, falls, and industry site-related cases were contributing factors to this finding.

A significant increase was reported in the number of lacerations and domestic injuries during the COVID-19 pandemic. The strict stay-at-home protocols might reduce certain mechanisms of trauma including accidents; however, it aggravates some other mechanisms such as domestic violence (6).

Conclusion

The COVID-19 outbreak, which was concurrent with the Iranian New Year, caused dramatic changes in trauma centers all over the world. Iran being considered as one of the countries with RTAs as a leading cause of mortality and morbidity, experienced similar changes in trauma cases. Based on the analyses, the proportion of the laceration injuries had increased in the study period. The injuries on

the upper limb increased as well. In the two periods compared, the high energy traumas decreased and oppositely, the low energy traumas increased. It seems that after the onset of the COVID-19 outbreak, changes in life style of the patients, including the need for being away from the infection, especially staying at home and avoiding travelling, etc. have contributed to these changes. In patients who referred to Sina hospital in four months after the outbreak, the numbers of lacerations increased. Given the changes in life style and portion of the injury sites, it seems that staying at home for a long time compared to before the outbreak has a great impact in this results, however for definite conclusion, further studies and evaluation are needed.

Conflict of Interest

The authors declare no conflict of interest in this study.

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References

1. The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China. *Zhonghua Liu Xing Bing Xue Za Zhi*. 2020;41(2):145-51. doi: [10.3760/cma.j.issn.0254-6450.2020.02.003](https://doi.org/10.3760/cma.j.issn.0254-6450.2020.02.003). [PubMed: [32064853](https://pubmed.ncbi.nlm.nih.gov/32064853/)].
2. World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report - 88 [Online]. [cited 2020]; Available from: URL: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200417-sitrep-88-covid-191b6cccd94f8b4f219377bfff55719a6ed.pdf?sfvrsn=ebe78315_6
3. World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report - 72 [Online]. [cited 2020]; Available from: URL: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200401-sitrep-72-covid-19.pdf?sfvrsn=3dd8971b_2
4. World Health Organization. COVID-19 explorer [Online]. [cited 2020]; Available from: URL: <https://worldhealthorg.shinyapps.io/covid>
5. Azami-Aghdash S, Sadeghi-Bazargani H, Shabaninejad H, Abolghasem GH. Injury epidemiology in Iran: A systematic review. *J Inj Violence Res*. 2017;9(1):27-40. doi: [10.5249/jivr.v9i1.852](https://doi.org/10.5249/jivr.v9i1.852). [PubMed Central: [PMc5279990](https://pubmed.ncbi.nlm.nih.gov/28039683/)].
6. Claudet I, Marchand-Tonel C, Ricco L, Houze-Cerfon CH, Lang T, Brehin C. During the COVID-19 Quarantine, Home Has Been More Harmful Than the Virus for Children! *Pediatr Emerg Care*. 2020;36(9):e538-e540. doi: [10.1097/PEC.0000000000002205](https://doi.org/10.1097/PEC.0000000000002205). [PubMed: [32868552](https://pubmed.ncbi.nlm.nih.gov/32868552/)].