A Study of Trauma Patients in the Emergency Department of a Tertiary Care Hospital in Nepal during Lockdown in COVID-19 Pandemic

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ABSTRACT

Background

The nationwide lockdown was imposed upon by the Government of Nepal with regards to the COVID-19 pandemic. Even during times of limited mobility and travel, trauma cases were presenting to the hospital.

Objective

To asses trauma patterns among patients presented to the Emergency department in Dhulikhel hospital during the lockdown period. The assessment of the burden of trauma during the pandemic could aid in planning allocation of resources and improving trauma care.

Method

A retrospective cross-sectional study design was used to assess all patients with a history of trauma during the period of lockdown announced by the Government of Nepal for COVID-19 from March 24 to June 14, 2020.

Result

Among 2097 patients that visited the emergency department, 23% were trauma cases. In comparison to the corresponding time-period in 2019, trauma cases reduced by more than half (54.5%). The majority of patients utilized ambulances as a means of transportation; a few patients utilized Dhulikhel emergency medical services. The most common mechanism of injury was fall injury, followed by motor vehicle accident and physical assault. Traumatic brain injury occurred in 30% of patients. Of all patients, 71% were discharged after initial treatment, 26% were admitted to different wards and 3% were referred to other health centres.

Conclusion

Fall injury is a crucial public health concern followed by motor vehicle accident among trauma patients even during the pandemic condition. Thus, emergency rooms should aid in planning for preparedness, mitigation of trauma during situations like these, in planning the allocation of resources and improving trauma care.

KEY WORDS

COVID-19 pandemic, Lockdown, Trauma

INTRODUCTION

COVID-19 is a new challenge for entire medical sciences to face in this decade and has taken its toll on all aspects of human lives.[1,2] Many strategies have been developed to face this unprecedented situation for both hospital and community settings.[3-5] One of the most effective public health strategies to flatten the curve of the pandemic cases and decrease mortality was suggested to be social distancing.[6,7] The Government of Nepal, adopting the same strategy, enforced a nationwide lockdown of all public facilities from 24th March till 14th June 2020.[8] Although some consideration had been shown to transport essential goods and construction materials, the general public was restricted to their own residence.[9,10]

The major cause of trauma in developing countries and this region are fall injuries and motor vehicle accidents.[11-13] Despite the fact that the Government of Nepal, as part of their COVID-19 management, have significantly restricted the activity of the general population, many trauma cases presented to the emergency department (ED) contrary to the general assumption that decreased mobility of people will decrease the incidence of trauma.[8]

This study aimed to study on the trauma patterns among the patients presented to the ED in Dhulikhel hospital during the lockdown period. There are studies addressing the causes of trauma previously but this study assessed trauma patterns among patients presented to ED during a period of a nationwide lockdown. The assessment of the burden of trauma during pandemic could aid in planning for preparedness, mitigation of trauma during situations like these, in planning the allocation of resources and improving trauma care in ED.

METHODS

This was a retrospective cross-sectional study conducted at Dhulikhel hospital, Kavre, Nepal. It is a tertiary level hospital located 30 kilometers east of Kathmandu. The hospital has 425 beds, which are distributed across ten departments.

All patients who were presented to the ED at Dhulikhel Hospital with the a history of trauma during the period of lockdown imposed by the Government of Nepal for COVID-19 from March 24, 2020 to June 14, 2020 were included in the study.

Data was collected accessing the electronic medical system from ED regarding demographic data, mode of transportation, mechanism of injury, and outcome of the trauma patients. For the comparison to the corresponding time-period in 2019, data was also abstracted from the medical system from ED. Ethical approval was obtained from the Institutional Review Committee, Kathmandu University School of Medical Sciences (IRC-KUSMS) before conducting the study.

Data was sorted, coded, and entered into Microsoft access and then to Statistical Package for the Social Sciences (SPSS) software version 18 for management and analysis. Numbers and proportions were calculated to describe the demographic and clinical characteristics of all trauma patients, mode of transportation and outcome of trauma patients.

RESULTS

Demographic and clinical characteristics of trauma patients

During the study period between 24 March and 14 June 2020, a total number of 2097 patients received treatment to ED. Among them 473 (23%) were trauma patients. In 2019 during the same time period, a total number of 3010 patients visited ED, where 1041 (35%) patients were trauma patients (table 1). The majority of patients (n = 339, 72%) were male. The male to female ratio was 2.5:1. The mean age of patients was 33.0 ± 20.3 years (range 1-92 years). Of all trauma patients involved, the majority of patients (n = 208, 44%) utilized ambulances as a means of transportation to arrive at the ED whereas a few trauma patients (n = 24, 5%) utilized Dhulikhel emergency medical services (DEMS) followed by the private vehicles. The most common mechanism of injury in trauma patients was fall injury (n = 250, 53%), followed by motor vehicle accident (n = 77, 16%) and physical assault (n = 54, 11%) (table 2).

Table 1. Categories of patients visiting ED at Dhulikhel Hospital, Kavre, Nepal, in 2019 and 2020 (24 March – 14 June)

Patients visited in ER	Non-traumatic patients	Trauma Patients
In 2019 (n=3010)	1969 (65%)	1041 (35%)
In 2020 (n=2097)	1624 (77%)	473 (23%)

Table 2. Mechanism of Injury of trauma patients visiting ED at Dhulikhel Hospital, Kavre, Nepal, 24th March – 14th June 2020. (n = 473)

Mechanism of Injury	n	(%)
Fall Injury	250	(53)
Motor Vehicle Accident	77	(16)
Physical Assault	54	(11)
Cut Injury	38	(8)
Others	28	(6)
Hit by object	18	(4)
Missing	8	(2)
Total	473	(100)

Outcome of trauma patients

Of the 473 patients included in the analysis, traumatic brain injury occured in 140 (30) patients. Of all patients, 336 (71) were discharged after initial treatment, 124 (26) were admitted to different departments at Dhulikhel hospital and 13 (3) patients were referred to other health centres (fig. 1). Among those trauma patients, who were admitted in the hospital, 76 (61) were admitted in orthopedics and traumatology ward, 37 (30) in surgery ward, 4 (3) in dental ward and 3 (2.5) patients were admitted in pediatric ward (fig. 2).

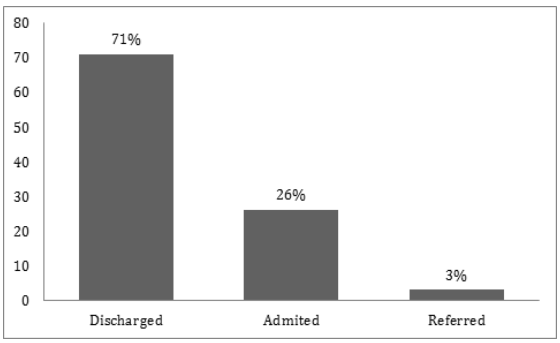

Figure 1. Outcome of trauma patients visiting ED at Dhulikhel hospital, Kavre, Nepal, 24th March – 14th June 2020. (n = 473)

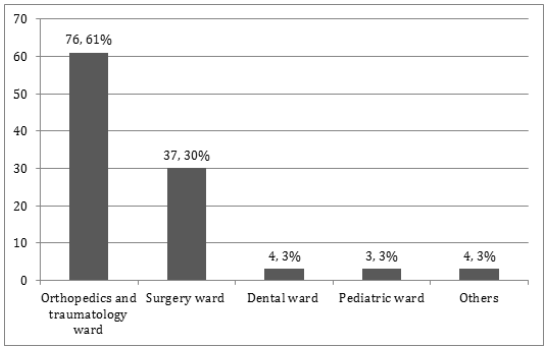

Figure 2. Department of admitted trauma patients visiting ED at Dhulikhel hospital, Kavre, Nepal, 24th March – 14th June 2020. (n = 124)

DISCUSSION

This is the first study to assess the patterns of trauma patients during the COVID-19 pandemic in a tertiary care hospital in Nepal. The first case of COVID-19 in Nepal was detected on January 23, 2020 on a returnee from Wuhan, China.[14] By March 19, 2020, when Nepal had no active cases, Nepal implemented the closure of all the schools. Two months after the first case, the second case was diagnosed through domestic testing on March 23, 2020 on a returnee from Europe. In response to this, Nepal decided to close its international borders and imposed a national level lock-down from March 24 until June 14 (74 days) 2020.[8]

This study showed that trauma is one of the major reasons for a visit to the ED (23%). This is considered a high percentage compared to the 20% reported in a study conducted 2013 in this institution.[13] The high rate observed in our study can be explained by the fact that traumatic injuries are a rising problem especially in low- and middle-income countries (LMICs).[15] In Nepal, trauma-related deaths account for 10% of the total mortality.[16] Death related to trauma was not reported in our study. However, evidence reported that the discrepancy in trauma deaths between LMICs and high-income countries is partly attributable to the inadequacy of hospital and community-based emergency care.[17]

As seen in most of the trauma series, there was male preponderance in cases with trauma in this study (72%). Other studies conducted in Nepal and India also reported similar finding.[13,18,19] This finding could be explained by the fact that the greater mobility of males for either work, recreation or for other activities or more likely to be employed as drivers and mechanics in cars and trucks resulting in a higher exposure to the risk of traffic injuries.[20]

The mean age of the trauma patients who received care in our ER was 33.0 ± 20.3 years. The majority of the studies conducted in Asia and America had a similar finding.[13,18,21,22] Bajracharya et al. reported that trauma usually affects the younger generation, which leads to a major social and economic burden in developing countries.[18] This high rate of the younger group can be attributed to the fact that these people are more active and reckless, whereas with increasing age people tend to be more careful and take more safety measures.[13]

The majority of the patients were transported by local ambulances to the ER in our study. Whereas a few patients were transported by DEMS which was established in 2013 at Dhulikhel Hospital. It can be considered a pioneer in providing pre-hospital emergency medical service through trained medical personnel in ambulances.[23] DEMS, aimed to bring pre-hospital care services to patients outside of Kathmandu Valley, serving the predominantly rural Kavrepalanchowk and Sindhupalchowk districts. DEMS, with the support of the Canadian and Nepal Red Cross Society, built a dispatch center in 2019, and now coordinates 31 ambulances located throughout the two districts.[24] Evidence in developed countries have shown that early intervention by trained paramedics decreases mortality rates in trauma cases.[25,26] A study conducted in this institution in 2018 found the main reason for not arriving on an ambulance was that they did not know the ambulance phone number and there was an ease in finding another vehicle.[23] The study highly recommended for the development of three-digit phone number for ambulance services at the local level which will make people easier to remember and contact.[23] This has come into reality as an important milestone for Dhulikhel hospital that obtained permission to use 102 (three-digit toll-free number) as its operating number in 2020 by the Government of Nepal.[24] However, this information has to be publicized so that many people could benefit from the use of trained paramedic equipped ambulances of DEMS in this region.

In the paucity of motor vehicles on the road, the most common mechanism of injury was fall injury followed by motor vehicle accident in our study. A similar finding was reported by the study conducted in eastern part of Nepal.[18] This is on par with previous records of ED since patients received are mostly from a hilly geographic region where people are involved in climbing trees for wood and fodder.[18] Hence, most were admitted to the orthopedic and traumatology department. Fall injury from the height was the most common mode of injury in another study conducted in this department in 2013.[13] In contrast, several other studies reported motor vehicle accident was one of the major causes of trauma and supported the evidence that it still remains the major cause of injury in the developing countries.[18,19,27,28] A study conducted in India revealed that 16% of motor vehicle accident victims were allegedly under the influence of alcohol.[19] In comparison to the corresponding time-period in 2019, trauma cases reduced by more than half (54.5%). The main reason for this could be because during the COVID-19 pandemic, the country had imposed a nationwide lockdown of all nonessential services including road transport (except for essential supplies and ambulance services).[29] However, despite these restrictions, our study has shown that it was the second most common mechanism of injury who received care in the ED during the study period.

Traumatic brain injury (TBI) was found in 30% of our trauma patients. This finding is also evidenced by study which concluded that TBI is the major public health problem in developing countries resulting in significant morbidity and mortality among the young productive people of the society.[19]

The limitation of this study includes analyzing the patients that visited our hospital only for trauma management, at a single-center university hospital. This may not be representative of a country profile.

Due to lack of enough information, we could not report on the duration of transportation from the scene to ER at the hospital for treatment. This could affect the outcome of trauma management.

CONCLUSION

Fall injury is a crucial public health concern followed by motor vehicle accident among trauma patients visited to the ED even during COVID-19 pandemic. Thus, the department should aid in planning for preparedness, mitigation of trauma during situations like these, in planning the allocation of resources and improving trauma care. DEMS dispatch centers can be reached by dialing Nepal's national emergency hotline number, 102. This information has to be publicized so that many people could benefit by the use of trained paramedic and medically-equipped ambulances of DEMS in this region. We recommend more studies to investigate the trauma pattern further across the country.

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