



India and Covid-19: The Changing Trends in Epidemiology of Fracture Distal End Radius

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Abstract

Background: Distal radius fractures (DRF) are one of the most common fractures seen in the emergency department. The aim of our study was a thorough assessment of impact of COVID-19 pandemic on epidemiological trends of DRF. There is limited data on possible changes in epidemiology of DRF in both adults and children. **Methods:** This retrospective observational study was performed at a tertiary trauma center in India. Data were collected from emergency admission records register. The data from 1st April 2020 to 31st December 2020 were compared with that of corresponding period of 2019 i.e 1st April 2019 to 31st December 2019. **Results:** In our study we observed that the total number of patients suffering from DRF that were hospitalized in 2020 were 14.6% lower than the pre-COVID 19 period (2019). There was a significant decrease in number of adults hospitalized due to DRF (from 125 to 102) in 2020 ($p < 0.05$). **Conclusion:** Our study showed a significant effect on epidemiology of DRF due to COVID-19 pandemic. The trends and results observed in our study will be helpful to health authorities in planning strategies to tackle a similar situation in future.

Keywords: COVID-19, Orthopedic Trauma, Epidemiology, Distal Radius, India

INTRODUCTION

Distal radius fractures (DRF) are one of the most common fractures seen in the emergency department. DRF account for approximately 1/6th (17%) of all

fractures seen in emergency.^[1-4] Around 6% of all women will have a DRF by age of 80 years.^[5] The World Health Organization (WHO) declared Coronavirus disease 2019 (COVID-19) as pandemic on 11th March 2020.^[6] Since



then COVID-19 pandemic has significantly affected the healthcare system all over the world. COVID-19 pandemic has altered the admission trends and routines in emergency and outpatient department.^[7] DRF can be treated surgically and non surgically.^[8,9] Non operative management options include closed reduction and application of plaster cast or a splint for immobilization.^[10-12] Operative management options include Kirschner-wire, open reduction and internal fixation with plates and screws or external stabilization with the help of external fixator.^[11,12] To reduce the risk of medical personnel getting infected with COVID-19, some hospitals increased the number of indication for conservative treatment.^[13,14]

The aim of our study was a thorough assessment of impact of COVID-19 pandemic on epidemiological trends of DRF. There is limited data on possible changes in epidemiology of DRF in both adults and children.

MATERIAL AND METHODS

This retrospective observational study was performed at a tertiary trauma center in India. Data were collected from emergency admission records register. The data from 1st April 2020 to 31st December 2020 were compared with that of corresponding period of 2019 i.e 1st April 2019 to 31st December 2019.

The study included all acute orthopaedic trauma referrals and fresh trauma cases with distal end radius fractures presenting to emergency department. Patients presenting for postoperative follow ups and patients with old injuries (date of injury before 1st April) were excluded from the study. Our study is a retrospective, descriptive observational study using hospital admission records, thus there was no patient contact.

Statistical analysis: The statistical analysis was performed using SPSS 27.0 for MAC (SPSS Inc. Chicago,IL, United States). The categorical data was expressed as numbers with percentages and represented in the form of stratified bar charts wherever possible. Continuous data was expressed as medians with range and plotted as box and whisker chart. Categorical data was evaluated using Chi-square test and Fisher's exact test to determine the level of significance. A p value of <0.05 was considered statistically significant.

RESULTS

In our study we observed that the total number of patients suffering from DRF that were hospitalized in 2020 were 14.6% lower than the pre-COVID 19 period (2019) (Table.1).

**Table 1:** Patient demographics during 2020 in comparison to corresponding period of 2019

VARIABLE	2020	2019	P value (< 0.05)
TOTAL NO. OF PATIENTS	147	172	NO
TOTAL NO. OF CHILDREN (<18 YEARS AGE)	45	53	NO
TOTAL NO. OF ADULTS (>18 YEARS OF AGE)	102	119	YES
CHILDREN (TREATED CONSERVATIVELY)	38	44	NO
ADULTS (TREATED CONSERVATIVELY)	92	88	YES
CHILDREN (TREATED SURGICALLY)	7	9	NO
ADULTS (TREATED SURGICALLY)	10	37	YES
MEAN AGE OF PATIENTS	41 yrs 3 months	44 yrs 6 months	NO
MALE TO FEMALE RATIO	1.2	0.9	NO

Male to female ratio increased from 0.9 in 2019 to 1.2 in pandemic period (2020). There was a significant decrease in number of adults hospitalized due to DRF (from 125 to 102) in 2020 ($p < 0.05$). A decrease of 4.3% was seen in number of children hospitalized due to DRF. A significant increase in number of adults being treated conservatively was seen (90.2% adult patients were treated

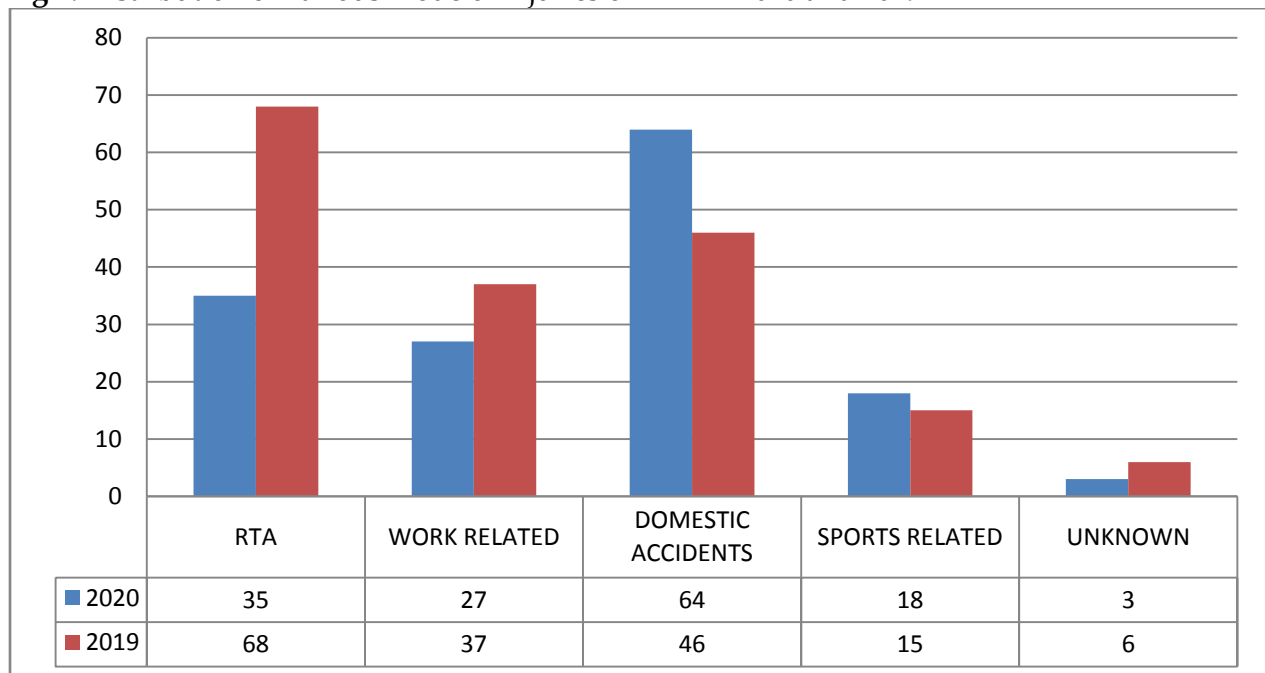
conservatively in 2020 in comparison to 73.9% in 2019). ($p < 0.05$). A slight increase in proportion of pediatric patients who were treated conservatively was seen in pandemic (2020) period (84.4% in 2020 in comparison to 83% in 2019). Analysis of the adults treated surgically revealed that there was a significant decrease in percentage from 31.09 % in 2019 to 9.8%

in 2020 ($p < 0.05$) while only a slight decrease was observed in number of surgically treated pediatric patients. Decrease in mean age of patients hospitalized due to DRF in pandemic period (41 years 3 months) was noted in comparison to pre-COVID 19 period (44 years 6 months).

In terms of mode of injury (Fig.1), in 2020, there was a significant decrease in

number of road traffic accidents (23.8% vs 39.53%) ($p < 0.05$). Reduction in number of cases related to workplace was also noted. (18.3% vs 21.5%). Our analysis revealed a significant increase in number of domestic accidents (43.5% vs 26.7%) while there was a slight increase in number of sports related injuries (12.24% vs 8.7%).

Fig 1: Distribution of various mode of injuries of DRF in 2020 and 2019



DISCUSSION

The COVID-19 pandemic had a major impact on lives of both adults and children. Preventive measures in the form of strict lockdown and shutting down of schools, opted by the ruling government have affected DRF

epidemiology. Decrease in number of admission of patients suffering from DRF (especially the significant decrease in adults) can be explained by the strict lockdown implemented by the government of India from 25th March, 2020 to cease the coronavirus transmission. This led to drastic



decrease in public gathering and mobility which further diminished the chances of outdoor orthopedic injuries. Similar decrease or even more pronounced figures were noted in other studies worldwide.^[15,16]

Our study revealed a decrease in the mean age of patients during the pandemic period, which may have been the result of fear in the minds of elderly population of visiting an emergency department getting infected with coronavirus disease. Similar trend was seen in the study conducted by Jaroslaw et al. in Poland.^[17] Whereas, Lv et al. reported an increase in mean age of patients presenting to orthopedic emergency with DRF in China.^[18] We observed a significant increase in number of adult patients undergoing conservative management for DRF. This can be explained by the change in treatment policies and strategies adopted by the hospital administration and the government of India to minimise the risk of health personnel getting infected with COVID-19. So only emergency surgical procedures were being performed in operation theatre and elective surgeries were withheld. Increase in number of overall trauma patients being treated conservatively has been reported in many studies conducted worldwide.^[19,20]

Taking mode of injury into consideration, a significant decrease in number of DRF due to road traffic accidents (RTA) was observed. This was

due to lockdown restrictions implemented by the government of India as discussed earlier, which led to decreased mobility on roads and ultimately drastic drop in cases of RTA. Decrease in RTA was also reported in a study conducted by Poggetti et al. in Italy.^[21] A significant increase in DRF due to domestic accidents was observed in pandemic period as people were asked to remain in their home and lockdown was in motion, so chances of domestic accidents increased. Significant decrease in domestic accidents was also reported by Poggetti et al.^[21]

There are few limitations in our study. Firstly, it is a retrospective observational study done via collecting data from hospital record, so there are chances of sampling error. Secondly, this study is performed at a single centre and may not represent the epidemiological trend across the nation. Thirdly, epidemiology of DRF during COVID-19 pandemic may be influenced by factors like hospital policy and protocol which was not considered in this study.

CONCLUSION

Our study showed a significant effect on epidemiology of DRF due to COVID-19 pandemic. There was a significant decrease in total number of DRF patients reporting to emergency room during pandemic period and significant increase in number of adult DRF patients being treated conservatively



was seen. The trends and results observed in our study will be helpful to health authorities in planning strategies to tackle a similar situation in future. We recommend more studies on impact

caused by COVID-19 pandemic on DRF epidemiology to see whether similar trends were present across the country.

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