

Comparison of PRE and POST COVID-19 Pandemic burn statistics: Initial experience from Rawalian Burn Center, Holy Family Hospital, RMU, Rawalpindi, Pakistan

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Author's Contribution

¹ Conception of study

¹ Experimentation/Study conduction

¹ Analysis/Interpretation/Discussion

¹ Manuscript Writing

¹ Critical Review

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Abstract

Objectives: To determine the change in the trend of burn patient epidemiology after the COVID-19 pandemic in terms of frequency of burn injury and mortality rate.

Material and Methods: This cross-sectional descriptive study was carried out at Rawalian burn center, Plastic Surgery Department, Holy Family Hospital RMU Rawalpindi from 1st March to 31st July over a period of 05 months. All burn patients reporting to the Rawalian burn center during the specified period were included in this study by consecutive sampling. Patients were mainly admitted from emergency and some from OPD following the standard admission, inclusion, and exclusion criteria

Results: Mean age of patients in the pre-COVID (Control) period March to July 2019 was 28.84 years with an SD of ± 3.73 . There were 63% females and 37% males. The total burn surface area range was 8-65% during this period. Whereas in the post-COVID period, March to July 2020 mean age of patients was 29.13 years with an SD of ± 4.06 . There were 60% females and 40% males. Whereas the total burn surface area range was 10-61% during this period. Frequency per month of burn injury progressively reduced to 58 patients and mortality rate to 1 in July 2020 (post-COVID period). The overall frequency of burn injury (n) during the control period was 367 patients whereas in the post-COVID period is reduced to 326 patients. So there was an 11.17% reduction as compared to the control period. A Chi-square test was applied and was found significant.

Conclusion: Based on the current study it can be concluded that there is a progressive fall in frequency of burn injury and mortality rate during the ongoing COVID-19 pandemic as compared to the PRE-COVID period however further studies are needed to explore the cause of this falling trend.

Keywords: COVID-19, Burn Statistics, Burn Frequency, Mortality Rate, Rawalian Burn Center.

Introduction

Pakistan has been affected by COVID-19 as is the case with the rest of the world. This infection initially started from the Hubei province of China and became pandemic over a very short time. 2019 novel coronavirus (2019-nCoV) belongs to beta-genus coronaviruses. It causes severe pneumonia and it is the cause of the present outbreak. The International Committee on Taxonomy of Viruses has reported that the official classification of the new coronavirus is known as Severe Acute Respiratory Syndrome Coronavirus-2 SARS-CoV-2.¹ The World Health Organization has also stated that the official name of the disease caused by the virus is COVID-19.² Numbers of burn centers around the world have shared their experiences during the pandemic.³ Different studies from around the world presented interesting changes in burn patient statistics. This study was started to see any change in statistics of burn patients in terms of frequency of burn injury and mortality rate in our setup.

Materials and Methods

Objectives: To determine the change in the trend of burn patient epidemiology after the COVID-19 pandemic in terms of frequency of burn injury and mortality rate.

Main Outcome Measures:

1. Frequency of burn injury.
2. Rate of Mortality.

This is a Cross-sectional Descriptive Study conducted at Rawalian burn center, Plastic Surgery Department, Holy Family Hospital RMU Rawalpindi. The study was carried out from 1st March to 31st July over a period of 05 months. All burn patients (n=326) reporting to the Rawalian burn center from March to July 2020 during the COVID-19 pandemic period were included in this study. In this study Consecutive sampling was used. Sample selection includes:

- **Inclusion criteria:** Burn patients of all age groups of either sex.
- **Exclusion criteria:** Patients in rehabilitation phase with healed burn wounds.

Patients (n=326) were mainly admitted from emergency and some from OPD following the standard admission criteria. Admission number of new patients, their demographic and social features, a surgical procedure done, morbidity, mortality, and calculated TBSA were recorded in a pre-designed

Proforma. A special management plan for these patients was made. The rest of the treatment conservative or surgical was as per routine with standard SOPs for COVID. After burn wound healing patients were discharged and followed on WhatsApp. Group only those patients who needed management of a certain complication were asked to visit the OPD. March to July 2019 (PRE-COVID Period-Control) was compared with March to July 2020 (POST-COVID Period) in terms of frequency of burn injury and mortality rate.

Data analysis: P-Value was set at 0.05. A Chi-square test was applied to see the statistical significance. Data was analyzed through SPSS-22.

Results

The mean age of patients in the PRE-COVID (Control) period March to July 2019 was 28.84 y with an SD of ± 3.73 . There were 63% females and 37% males. The total burn surface area range was 8-65% during this period. Whereas in the POST-COVID period March to July 2020 mean age of patients was 29.13 years with an SD of ± 4.06 . There were 60% females and 40% males. Whereas the total burn surface area range was 10-61% during this period (Table 1). So it can be seen that these characteristics are almost the same in the PRE and POST-COVID periods but there is a significant difference between the frequency of burn injury and mortality rate during these periods. Frequency per month of burn injury progressively reduced to 58 patients and mortality rate to 1 (Figure no. 1 & 2) in July 2020 (post COVID period). The overall frequency of burn injury (n) during the control period was 367 patients whereas in post COVID period is reduced to 326 patients (Table no. 2). There was an 11.17% reduction as compared to the control period. A Chi-square test was applied and was found significant (Table no. 3). No COVID positive patient was admitted to our burn center during the study period through all preparations were done to receive such patients.

Table 1: Demographic and Social Features Of Patients

PARAMETER	PRE-COVID (CONTROL)	POST-COVID
YEAR	2019	2020
MEAN AGE(Y)	28.84	29.13
SD OF AGE	± 3.73	± 4.06
MALE	37%	40%
FEMALE	63%	60%
TBSA	8-65%	10-61%

Table 2: PRE and POST-COVID Burn patients’ statistics Rawalian Burn Center, HFH, RMU, Pakistan

PARAMETER	PRE COVID-19 (CONTROL)					POST COVID-19				
	2019					2020				
	Mar	Apr	May	June	July	Mar	Apr	May	June	July
Incidence of Burn injury	76	70	71	73	77	72	68	65	63	58
Rate of mortality	4	3	2	3	2	1	1	2	1	1
OPD Burn Dressing	790	791	795	823	829	750	650	655	722	698
OPD Consultation	815	819	850	901	928	823	723	730	839	779
O.T Cases	77	78	79	79	82	55	50	52	69	50

Table 3: Comparison of PRE-COVID (Control) Period with POST-COVID Period in terms of Burn Frequency and Mortality

PARAMETER	CONTROL PERIOD (March to July 2019)	POST-COVID Period (March to July 2020)	Pearson Correlation (Chisquare) Value	Significance
BURN FREQUENCY (n)	367	326	0.729	Significant at 0.05 level
MORTALITY RATE	14	06	0.800	Significant at 0.01 level

Frequency of burn injury

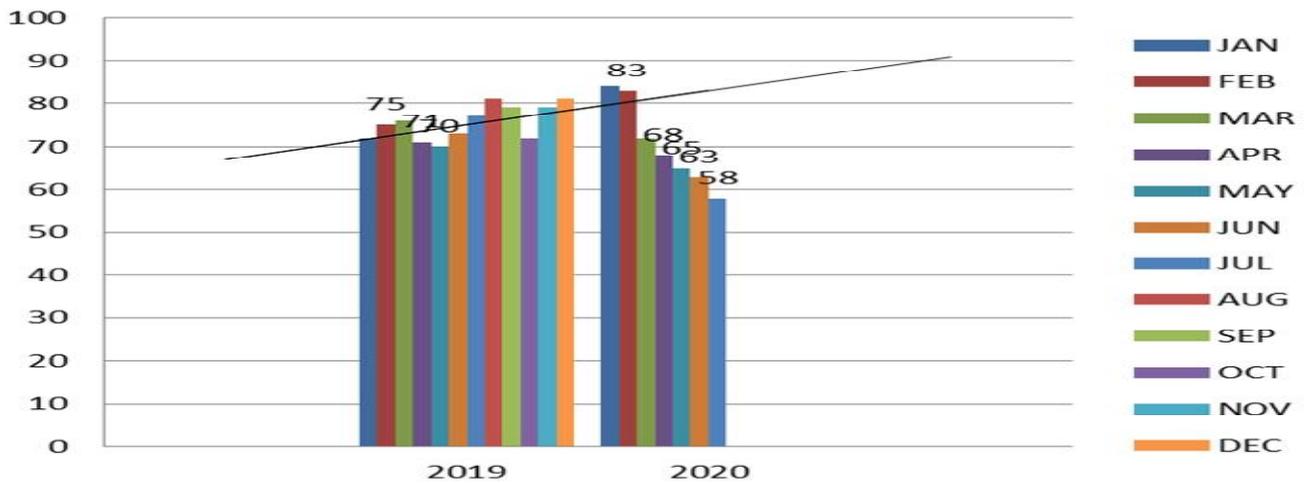


Figure 1: Frequency of burn injury in PRE-COVID CONTROL (MARCH-JULY 2019) and POST-COVID (MAR-JULY 2020) Period

Rate of Mortality

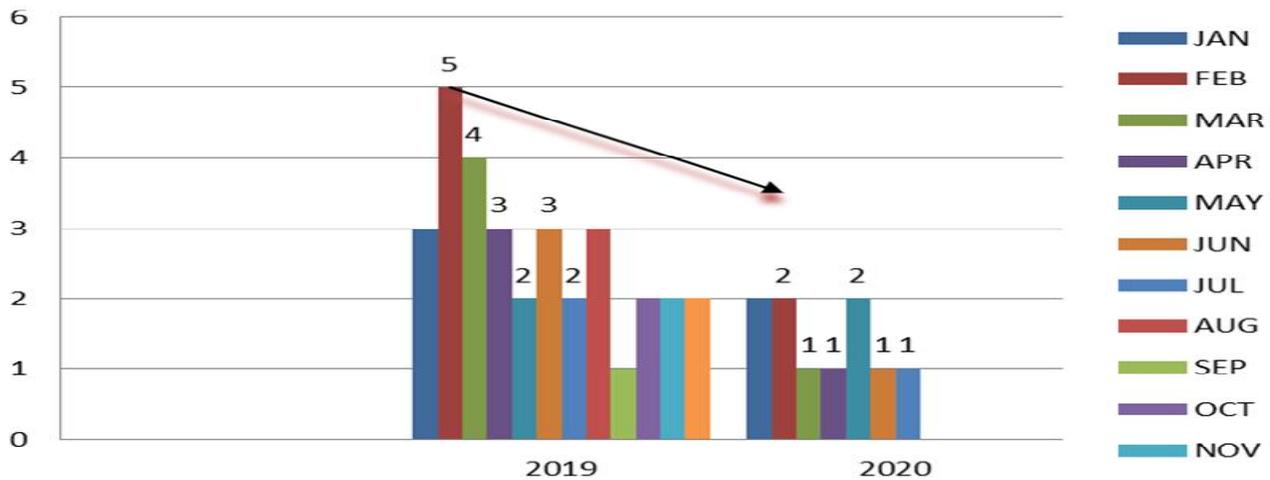


Figure 2: Rate of mortality in PRE-COVID CONTROL (MARCH-JULY 2019) and POST-COVID (MARCH-JULY 2020) Period

Discussion

Many authors from several countries have pointed out interesting changes in trends of burn epidemiology during the current COVID pandemic. Azzam farroaha⁴ in his study showed that the incidence of burn injury decreased during the COVID-19 pandemic as is seen in the present study. Although he reported a 33% decrease whereas in the present study 11.17% decrease was found. Similar to the present study no COVID positive burn patient was admitted during the study period. He compared other parameters like % TBSA but the present study is limited to burn frequency and mortality only.

Brewster CT⁵ in his study reported 30 fold increase in scalds related to steam inhalation for the treatment of COVID infection after collecting data from many burn centers with a maximum TBSA of 8%. D.Asta F. published his study⁶ on paediatric burn epidemiology during the COVID pandemic. He reported a 60% decrease in the frequency of paediatric burn patients attending the emergency department during the COVID pandemic period as compared to the control period supporting the results of this study. According to his study Royal College of paediatric and child health also raised concern on this issue because children might face harm due to delayed presentation to an emergency department. Al-Benna et al⁷ conducted research work on the availability of COVID-19 information and burn epidemiology from different national and international burn societies and websites during the recent pandemic and found it

missing in the vast majority. Mason et al⁸ also studied the epidemiology of burn among the hospitalized patients and reported a decrease in mortality but an increase in the frequency of burn patients during the pre COVID period. Fan Xiaoming et al⁹ admitted that information about burn epidemiology is rare in China and conducted a retrospective study to describe the epidemiology of burns over a 10-year PRE-COVID period. They reported overall mortality of 1.85%. Ryan CM et al¹⁰ studied burn epidemiology during the COVID-19 pandemic and put forward recommendations for the management of burn patients during the pandemic.

Shahmiri SS et al¹¹ also studied burn mortality during pre COVID period of 2017. Schiefer JL et al¹² during the pre COVID period of 2016 conducted a study to probe the incidence and etiology of severe burns in a german burn center. Similarly, Ehrl D et al¹³ reported a study on burn epidemiology in the year 2018.

Conclusion

Based on the current study it can be concluded that there is a progressive fall in the frequency of burn injury and mortality rate during the ongoing COVID-19 pandemic as compared to the PRE-COVID period. This downward trend is in line with the results of other international research projects however further studies are needed to explore the causes of this falling trend. This fall in frequency of burn patients presenting to burn center is raising the concerns that

these patients may be harmed by self-treatment at home or substandard facilities.

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