



“A COMPARATIVE RETROSPECTIVE STUDY TO EVALUATE THE IMPACT OF COVID 19 ON BURN MANAGEMENT IN CHHATTISGARH INSTITUTE OF MEDICAL SCIENCES, BILASPUR, CHHATTISGARH.”

General Surgery

Dr. Neeraj Shende Professor & Head Department of General Surgery, CIMS Bilaspur CG.

Dr. Raghuraj Singh Assistant Professor, Department of General Surgery, CIMS Bilaspur CG.

Dr. Himanshu Gupta Senior Resident, Department of Radiotherapy, CIMS Bilaspur CG.

Dr. Suman Kumar Kujur Senior Resident, Department of Radiotherapy, CIMS Bilaspur CG.

Dr. Chandrahas Dhruw* Assistant Professor, Department of Radiotherapy, CIMS Bilaspur, CG.
*Corresponding Author

ABSTRACT

Background: The COVID-19 disease, also known as the corona virus disease, is an ongoing global pandemic of corona virus 2019 (COVID-19) caused by severe acute respiratory syndrome corona virus 2 (SARSCoV-2). The virus was first identified in December 2019 in Wuhan, China. The World Health Organization declared a Public Health Emergency of International Concern regarding COVID-19 on 30 January 2020, and later declared a pandemic on 11 March 2020. As of 28 May 2021, more than 168 million cases have been confirmed, with more than 3.51 million confirmed deaths attributed to COVID-19, making it one of the deadliest pandemics in history. The virus that causes COVID-19 is mainly transmitted through droplets generated when an infected person coughs, sneezes, or exhales. Covid-19 infection also causes problems for the burn management and follows up of burn patients it is also interrupted mostly due to nationwide lockdown. **Objective:** To evaluate the impact of Covid-19 on burn patients IPD in Chhattisgarh Institute of Medical Sciences, Bilaspur, Chhattisgarh during Covid-19 pandemic. **Method:** This retrospective comparative clinical study is conducted in the department of General Surgery, Burn Unit, Chhattisgarh Institute of Medical Sciences, Bilaspur, Chhattisgarh. The 1 year IPD from 20 March 2019 to 20 March 2020 is compared with the data from Covid-19 era from 20 March 2020 to 20 March 2021. Frequency tables, comparative charts are used to evaluate and measure the data from the study to describe the impact of Covid-19 on burn management. **Result:** 258 out of 494 (52.2%) burn patients were females in Pre Covid-19 yr whereas male IPD patients were 47.8%. During Covid-19 pandemic year also the females were predominant in IPD i.e. 57.7% whereas male IPD population was 42.3%, 58 out of 494 (11.7%) patients had >80% burn in Pre Covid-19 year whereas 353 (71.4%) had burn <50%. During Covid-19 pandemic year the severe burn i.e. >80% declined minimally while the burn patients ranging 50-80% were increased. Death ratio in pre covid-19 year was 39%, male mortality was 34.5% and female deaths were found to be 65.4%. During Covid-19 pandemic year overall death ratio was decreased by 5%. **Conclusion:** We observed in our study in both years the female population was predominant. During Covid-19 pandemic year the severe burn i.e. >80% declined minimally while the burn patients ranging 50-80% were increased. Death ratio in pre covid-19 year was 39%, male mortality was 34.5% and female deaths were found to be 65.4%. During Covid-19 pandemic year overall death ratio was decreased by 5%.

KEYWORDS

Covid-19, Pandemic, IPD, Burn, Management, Mortality.

INTRODUCTION

Since the first outbreak at the end of 2019, the SARS-Corona Virus-2 spread quickly around the world, causing the so-called COVID-19 pandemic, a global public health care emergency^[1]. In the effort to constrain the spread, many countries embraced measures to guarantee social isolation, limiting outdoors activities, and thereby creating the risk of increasing domestic accidents leading to burn injuries^{[2][3]}.

However, preliminary data on global trends in burn injuries are inconsistent^{[4][5][6]} as the pandemic is still ongoing. Hospital footfall of patients for non-Covid complaints saw a major decline due to mobility restrictions as well as fear of contacting infection from hospitals. Burn injury is an acute emergency that demands an early initiation of treatment without any delay. Moreover, burn patients are in a state of hypermetabolism, hyperdynamic circulation, and are at a high risk of developing systemic inflammatory response syndrome (SIRS), i.e. multi-organ dysfunction, respiratory failure, hypotension, and thrombocytopenia followed by mortality.^{[7][8]} Burn patients are also physiologically immunocompromised, which adds to their vulnerability if they contract COVID-19 infection.^{[9][10]} Alteration in the epidemiology of burns is expected during the COVID pandemic due to change in the pattern of daily activities. To improve the outcome of burns during this pandemic, we needed to evaluate the incidence, risk factors, and outcome of COVID infection in burn patients. This will help us in future formulation of prevention and treatment guidelines for COVID-19 infection in burn patients. In this study, we compare the trends and outcome of burn and trauma patients between COVID and non-COVID study time period. We evaluate percentage of total body surface area (TBSA) of burns as a risk factor for increased chances of COVID-19 infection in burns. The outcome of COVID-19 infection in burns in terms of mortality has also been assessed.

OBJECTIVE

To evaluate the impact of Covid-19 on burn patients IPD in Chhattisgarh Institute of Medical Sciences, Bilaspur, Chhattisgarh during Covid-19 pandemic.

MATERIAL AND METHODS**METHOD:**

This retrospective comparative clinical study is conducted in the department of General Surgery, Burn Unit, Chhattisgarh Institute of Medical Sciences, Bilaspur, Chhattisgarh. The 1 year IPD from 20 March 2019 to 20 March 2020 is compared with the data from Covid-19 era from 20 March 2020 to 20 March 2021. Frequency tables, comparative charts are used to evaluate and measure the data from the study to describe the impact of Covid-19 on burn management.

RESULTS

This retrospective observational clinical study involved the burn patients' IPD data of pre Covid-19 year from 20 March 2019 to 20 March 2020 and data of first year of Covid-19 year from 20 March 2020 to 20 March 2021. This study is conducted in department of General Surgery, Burn unit, CIMS hospital, Bilaspur Chhattisgarh. All patients' IPD data of both years were thoroughly evaluated and studied. The results are as follows:

Gender

258 out of 494 (52.2%) burn patients were females in Pre Covid-19 yr whereas male IPD patients were 47.8%. During Covid-19 pandemic year also the females were predominant in IPD i.e. 57.7% whereas male IPD population was 42.3%, no patients of transgender community was reported. This data revealed that females were suffered more than males by burn.

Table 1 Gender wise Distribution of patients

Gender	Male	Female	Total
Pre Covid-19 year	236(47.8)	258(52.2)	494
Covid-19 pandemic year	162(42.3)	216(57.7)	378

Burn Percentage

58 out of 494 (11.7%) patients had >80% burn in Pre Covid-19 year whereas 353(71.4%) had burn <50%. During Covid-19 pandemic year the severe burn i.e. >80% declined minimally while the burn patients ranging 50-80% were increased.

Table 2 Burn Percentage Wise Distribution of patients

Percentage	<50%	50-80%	>80%	Total
Pre Covid-19 year	353(71.4%)	83(16.8%)	58(11.7%)	494
Covid-19 pandemic year	255(67.4%)	90(23.8%)	33(8.7%)	378

Mortality

Death ratio in pre covid-19 year was 39%, male mortality was 34.5% and female deaths were found to be 65.4%. During Covid-19 pandemic year overall death ratio was decreased by 5%. This data showed that female death ratio was increased in pandemic year by 9%.

Table 3 Mortality Wise Distribution of patients

Deaths	Male	Female	Total	Death ratio
Pre Covid-19 year	67(34.5%)	127(65.4%)	194	39%
Covid-19 pandemic year	33(25.7%)	95(74.2%)	128	34%

Socio-economic status

In Pre Covid-19 yr, 278 out of 494 (56.2%) patients of lower socioeconomic strata came for burn management, on the other hand 38.8% patients were of middle class economy status and only 4.8% were belonged to upper class. Whereas in Covid-19 pandemic year lower class patients reported was 62% and upper class were 10%. This data clearly stated that during the pandemic year the patients of upper socioeconomic strata were increased.

Table 4 Socio-economic status wise distribution of patients

SES	Lower Class	Middle Class	Upper Class	Total
Pre Covid-19 yr	278(56.2%)	192(38.8%)	24(4.8%)	494
Covid-19 yr	234(62%)	106(28%)	38(10%)	378

DISCUSSION

Burn injuries with TBSA of burns > 15% or when sustained in high-risk age groups like elderly and children require emergency hospital admission without delay. It is after threshold size of 15% burns that systemic spill over of cytokines starts, stimulating the brain to release catecholamine and glucocorticoids causing SIRS. [11] During SIRS in burns, bone marrow is in a state of emergency granulopoiesis with reciprocal reduction in lymphopoiesis and hematopoiesis. Upregulation of myeloid derived suppressor cells leads to immunosuppression. [12] It is important to understand the pathophysiology of COVID-19 infection, that is, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus, for assessing its impact in burn patients who are highly vulnerable to such infections. SARS-CoV2 is a single-stranded RNA virus. It spreads by attaching to the nasopharyngeal mucosa, followed by viral replication and transport to lungs causing lower respiratory tract infection. Viral RNA dictates host cell machinery for genome replication and polypeptide synthesis. Spike glycoprotein S promotes virus entry through the angiotensin-converting enzyme 2 receptors expressed in lungs, intestines, kidney, brain, and blood vessels. These receptors are negative regulator of the renin angiotensin system involved in inflammation. [13] [14] Therefore, COVID-19 infection in burns can, not only add to the latter's morbidity and mortality but also necessitate the requirement of longer intensive care for such cases. Further, health-care workers involved in burn care are also at a heightened risk in comparison to the general COVID care staff, due to increased contact time with raw burn wounds while dressing and during respiratory care of patients with inhalational burns. [15] To ensure safety of both patients and doctors from contracting COVID-19 infection, major departmental restructuring of working setup as well as protocols is being done. Setting up of isolation wards, negative pressure operation theatres, screening areas, and ensuring continuous supply of personal protection equipment, N-95 masks, face shields, sanitizers, disinfectants, fumigants, etc. is highly resource consuming. [16] [17]

[18] Limited elective operations will not work well for both waiting patients and doctors in the long run. Hence, we need to assess the true impact of COVID-19 infection on patient trends and outcomes,

presenting to a burn and plastic unit, especially burns. At the same time, we need to identify risk factors for COVID-19 infection in burn patients. This will help us understand the true epidemiology of COVID-19 infection in burns and help us formulate future planning and management for COVID-19 infection in burns in an economical and resource friendly manner.

CONCLUSION

We observed in our study in both years the female population was predominant. During Covid-19 pandemic year the severe burn i.e. >80% declined minimally while the burn patients ranging 50-80% were increased. Death ratio in pre covid-19 year was 39%, male mortality was 34.5% and female deaths were found to be 65.4%. During Covid-19 pandemic year overall death ratio was decreased by 5%.

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