

Efficacy of the Indian Healthcare Regimes to Tackle the Septic Shocks associated with Covid 19 Infections

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ABSTRACT

Background: The uninhibited spread of a novel coronavirus termed as severe acute respiratory disease coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses (ICTV), has led to the emergence of the coronavirus disease 2019 pandemic worldwide, more popularly known as the COVID19 pandemic. There have been over 86 million global confirmed cases till date, and the disease is known to have a 2.2% case fatality rate, having claimed over 1.87 million lives. Initially having being regarded as a purely respiratory disease with symptoms of viral pneumonia such as fever, fatigue, dry cough, and lymphopenia, Covid19 is now also known to wreak havoc on organs such as the kidney, heart, liver and on organ systems such as the blood and the immune system and lead to development of sepsis induced multiorgan dysfunction syndrome. Many older patients with existing comorbidities such as cardiovascular disease, liver disease, kidney disease or malignant tumours, have been recorded to have a more severe infection and have reportedly been at a higher mortality risk. Hence there is a need to be more attentive of the potential multi-organ injuries and to determine the factors that contribute to their progression in order to prevent the worsening prognosis that has come to be associated with COVID-19. Although the eventual progress towards multi-organ failure in severe Covid cases is established, the factors that contribute towards this menacing prognosis are rather an enigma. Results concluded from this study will surely help in determining the efficiency of the healthcare fraternity to tackle the Covid associated shock.

Objectives: Elaborating the linkage allying Covid 19 infections and septic shocks, to assess the efficacy of sepsis management, provided in the Indian healthcare system, to evaluate the approved protocol of management in emergent septic shocks of Covid patients.

Methodology: A validated questionnaire will be circulated amongst the doctors, medical executives and house residents posted in the Covid wards of various Government as well as private institutions. The data collected from the said questionnaires would be analysed using various statistical tests to have an accurate conclusion, depicted through graphical figures then.

Results: The study would play a key role to set the protocol for treatment of sepsis associated covid cases under scrutiny, benefiting the further advances in the treatment modalities.

Conclusion: The prognosis of sepsis in severe Covid 19 cases, mostly has a fatal end. This study would help to put emphasis on the treatment guidelines and modalities approved in the Indian healthcare system, to tackle this pathology.

Key words: Septicaemia, Coronavirus infection, Intensive care units, Interleukin levels, Sepsis management, Anti-inflammatory therapeutic approach

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INTRODUCTION

The committee of taxonomy of viruses has termed the gripping Corona virus infection as the SARS-CoV-2. This term was previously known as 2019-nCov. The covid virus has now turned out to be a rapidly expanding

pandemic which is affecting millions of individuals all across the globe. Coronavirus being categorized as a beta-CoV subgroup belonging to the Coronaviridae family [1], the virus shows confirmed transmission through respiratory droplets. Along with these transmission routes, certain routes such as spread by air droplets and fomites [2,3]. The SARS-CoV2 RNA was also identified in the stools of patients infected with COVID-19 [4].

Coronavirus infection has been known to show a wide range of symptoms from mild to severe form. The asymptomatic variant of this particular infection shows to be a real challenge in the diagnosis of this pathology [5]. In general, a high rate of patients has been found to be asymptomatic and the ones with mild infection exhibit the common cold manifestations, fever, dry cough, and myalgia [5], and show a favorable prognosis. The healthcare professionals, are working tirelessly, and are honoring their services towards the general population, despite the threat of getting infected. Worse outcomes have been observed in the middle-aged and elderly patients with primary chronic diseases especially, CVDs, diabetes, obesity, thyroid abnormalities, renal diseases and chronic respiratory diseases among others [6] who, therefore, had poorer prognosis and comparatively narrow chances to recover successfully [7]. On classification, the severe form of this covid 19 infection is known to have the aggravating forms of acute respiratory distress syndrome. In addition to lungs, the virus has been known to cause detriment to other organs such as the kidneys, liver, and heart, along with body systems such as nervous and hematological and induce multiorgan failure, multiorgan failure state is a very morbid stage and it is the terminal stage of covid 19 this stage required an immediate therapeutically response [8,9]. Even though we do not yet know the exact pathophysiology behind the occurrence of these septic shocks in covid patients, from the available medical evidence now it is clear that the factors of hyper inflammation and coagulopathy do contribute in the mechanism of aggravating the severity of the septic shocks. In regards to this, now various clinical trials are working to find the accurate treatment option that could revert this prognosis.

To tackle the septic shock in the covid patients resulting due to the cytokine storm, various treatment modalities have been proposed. Cytokine blockade agents along with anti-coagulants have been proposed to treat this prognosis. Arikara the drug in its phase 3 clinical trials has showed to positively decrease the effects of inflammatory mediators in this infection. As the studies have recently revealed, covid treatment guidelines now primarily focus on the cytokine storm, which are induced due to the increase in the number of il 6 and il 12. To Have more insight on this topic, phase 2 and phase 3 clinical trials based on the drug-tocilizumab have been currently approved by the Italy and the U.S. food and drug association. Regardless the results obtained from these trails have been ambiguous, and no particular drug has been assigned to majorly decrease the widespread

of sepsis. The reasons given to this were the probable complexity of the sepsis, and the multi factorial aetiology of the factors that are leading to this sepsis.

Even though the medical treatment is being provided meticulously to the patients, the death rates seem to be continuously rising. About 70% of the deaths of Covid 19 are due to the progression to sepsis. In these scenarios, it becomes important to assess the medical treatment and the guidelines of the therapeutic shocks that are currently being followed nationwide.

Although the eventual progress towards multi-organ failure in severe Covid cases is established, the factors that contribute towards this menacing prognosis are rather an enigma. Results concluded from this study will surely help in determining the efficiency of the healthcare fraternity to tackle the Covid associated shock.

Aim

Primary aim of this cross sectional survey is to deter in the ability of the ability of the covid care units in India to tackle the abysmal prognosis, of the septic shocks associated with the covid 19 infection.

Objectives

Elaborating the linkage allying Covid 19 infections and septic shocks.

To assess the efficacy of sepsis management provided in the Indian healthcare system.

To evaluate the approved protocol of management in emergent septic shocks of Covid patients.

MATERIALS AND METHODS

Study design

This study will be conducted in a form of cross sectional survey.

Study population

Study population that will be considered for this study will be Doctors, medical executives and house residents posted in Covid wards across the Government and private institutions, who are currently treating the patients suffering from severe Covid 19 cases progressing to sepsis.

Study period

This study will be carried out over the period of two months between the months of July 2021–September 21.

Study setting

This survey will be conducted in the form of an online questionnaire, which would be circulated to the doctors and medical executives along with the house residents who are posted in covid wards, treating severe Covid cases landing into the worsened prognosis of sepsis. The said questionnaire would be circulated in the aspired sample size through links using the certain platforms of social media. We will collect the data by using online

questionnaires, which will be circulated in the covid critical units and covid icus, where the medical executive treating the covid patients will fill the forms by evaluating the patients. The collected data will then be analysed and depicted in the graphical manner by conducting various statistical tests. The criteria for this particular study defines the sample population as follows:

Inclusion criteria

Clinicians who are treating covid 19 associated sepsis cases and those who are well acquainted with the stated treatment guidelines for treatment by the World health organization (WHO).

WHO (World health organization) issued guidelines for the treatment of Covid 19 along with the protocol issued by the Intensive care national Audit and research Centre will be considered as the reference points for this study.

The participants will participate voluntarily in this survey. The survey will be done after gaining approval from the institutional ethical committee (IEC). Electronic consent will be taken from all the eligible responders before answering the questionnaire.

ICNARC, recently formulated a questionnaire which would be used in this study. The questionnaire would ultimately assess the ability of the covid care centers and the covid care icus to tackle the effects of septic shock, thus helping in reducing the mortality rates. The questionnaires would assess the factors stated below;

Emergency Department (ED) management

How good according to the responder is the patient with septic shock managed in the emergency department of the hospital, also what are the various medical care facilities that are available to revert this abysmal prognosis.

Critical care unit management

How good according to the responder is the patient with septic shock managed in the critical care units of the hospital, also what are the various medical care facilities that are available to revert this abysmal prognosis.

Adjunctive therapies

Alternative possible treatment modalities that the critical care units and the emergency departments provide, in case the patient lands in the septic shock.

Mortality rates

Based on the previous data in the covid patients and assessing the treatment modalities, what are the mortality rates of the covid patients landing in septic shock.

Implications

The results of this survey will be used to assess the efficacy of the Indian healthcare system to manage the septic shocks associated with severe Covid 19 infection.

Methodology in PICOT form

P (Population)

This cross-sectional study would be conducted on the pre-decided sample size which would contain, Doctors, medical executives and house residents who are currently posted in Covid wards across the Government and private institutions, and are treating the patients suffering who are suffering from severe Covid 19 infection progressing to sepsis. We will collect the data by using online questionnaires, which will be circulated in the covid critical units and covid icus, where the medical executive treating the covid patients will fill the forms by evaluating the patients. The collected data will then be analysed and depicted in the graphical manner by conducting various statistical tests.

I (Intervention)

This study would help in intervening and assessing the efficacy of the Indian healthcare regimens in treating the cases of Covid 19 infections associated septic shocks.

C (Comparison)

This cross-sectional study will not be compared with other surveys of similar multitude.

O (Outcome)

The results which will be concluded from this study shall help in Identification of the effectiveness of the treatment protocols for the emergent septic progression in Covid 19 cases in Indian healthcare setting.

T (Time)

This study would be conducted over a period of two months 9 (from July 2021 – September 2021).

Measurements

To conclude the results, an online questionnaire based statistical evaluation, with analytical tests will be performed.

Quantitative variables

No quantitative variables will be used in the statistical analysis of this study.

Statistical methods

The data collected through the process of assessing responses to the online questionnaire will then be analysed, using various statistical tests and shall be depicted in a suitable graphical manner. The statistical tests that will be referred for the analysis will include the use of Chi square test, inter-quartile range analysis and the use of spss software.

RESULTS

The study that is to be conducted will surely help in estimating the ability of the current health care regimens to tackle the septic prognosis in severely affected Covid 19 cases. As it has been already observed that this abysmal prognosis is certainly difficult to treat and the end result is almost always fatal, it is necessary to

put a light on the treatment guidelines that are in the streamline.

DISCUSSION

The vigorous spread of Covid 19 pandemic has affected almost each and every sector in the community as well as the medical fraternity. While many countries have been facing the consequences of this insistent state of lockdown and medical burdens due to the pandemic, India is suffering under the wrath of the widespread of this Covid 19 virus. The said pandemic has recently taken an aggressive widespread course; resulting in an increased number of cases succumbing to the pathogenesis of this disease. The rapidly elevating graph of the fatalities is observed due to the extra-pulmonary advancing ability of the coronavirus infection. In the cases presenting with severe Covid 19 infection, almost 5% of patients are seen progressing to the pathology known as multi-Organ Dysfunction Syndrome [MODS].

As the studies have recently revealed, covid treatment guidelines now primarily focus on the cytokine storm, which are induced due to the increase in the number of il 6 and il 12 [3,10]. To Have more insight on this topic, phase 2 and phase 3 clinical trials based on the drug – tocilizumab have been currently approved by the Italy and the U.S. food and drug association. Regardless the results obtained from these trails have been ambiguous, and no particular drug has been assigned to majorly decrease the widespread of sepsis. The reasons given to this were the probable complexity of the sepsis, and the multi factorial aetiology of the factors that are leading to this sepsis [4,5,11,12].

The uninhibited spread of a novel coronavirus termed as severe acute respiratory disease coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses (ICTV), has led to the emergence of the coronavirus disease 2019 pandemic worldwide, more popularly known as the COVID19 pandemic. There have been over 86 million global confirmed cases till date, and the disease is known to have a 2.2% case fatality rate, having claimed over 1.87 million lives. Initially having being regarded as a purely respiratory disease with symptoms of viral pneumonia such as fever, fatigue, dry cough, and lymphopenia, Covid19 is now also known to wreak havoc on organs such as the kidney, heart, liver and on organ systems such as the blood and the immune system and lead to development of sepsis induced multiorgan dysfunction syndrome. Many older patients with existing comorbidities such as cardiovascular disease, liver disease, kidney disease or malignant tumours, have been recorded to have a more severe infection and have reportedly been at a higher mortality risk. Hence there is a need to be more attentive of the potential multi-organ injuries and to determine the factors that contribute to their progression in order to prevent the worsening prognosis that has come to be associated with COVID-19.

Although the eventual progress towards multi-organ

failure in severe Covid 19 cases is established, the factors that contribute towards this menacing prognosis, still are rather an enigma. The clinical elements which serve as an important milestone in the course of this deteriorating prognosis, till date remains a mystery. The conclusions derived from this study would surely help in enlightening the lesser-known facts about the strong virulence of the said virus and in determining an accurate clinical profile of patients landing in multi-organ dysfunction syndrome, thereafter helping to put a curb on this pathological condition.

As an alternative to this treatment, the WHO has approved the use of drugs like corticosteroids, which effectively decrease the levels of inflammatory mediators in the body. Though this treatment modality has its pros and cons, nevertheless the beneficial effects have an upper hand [13]. Confirming these particular findings, 7 clinical trials conducted by the WHO and the Recovery trails, state that the drugs under corticosteroid have an amazing capacity to decrease the mortality rates related to Covid in the ICU in the patients having symptoms of septic shock [14,15]. Zhang, et al. [16] in his meta- analysis confirmed that dexamethasone among all the steroids has a dramatically higher calibre to reduce the mortality rates in sepsis induced covid patients. Dexamethasone in various randomized trials conducted has proved to be the absolute drug to reduce the levels of inflammatory mediators and blunt the effects of septic shock, thus reducing the mortality rates, like corticosteroids, which effectively decrease the levels of inflammatory mediators in the body. Though this treatment modality has its pros and cons, nevertheless the beneficial effects have an upper hand [17-23].

Leishman, et al. [18] in his clinical trials proved that in the current covid scenario there is no particular role of cytokine blockade agents to reverse the after effects of this septic shock as only corticosteroids prove to the drug having beneficiary effects in the treatment. However there has been slight evidence of anti-coagulants, which might contribute in down scaling the septic shock.

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CONFLICT OF INTEREST

This particular study does not face any conflict of interest.

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