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Association of the first biochemical parameters taken in the emergency department in Covid-19 patients with the outcome

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Abstract

First the world did not anticipate the depth of the disease but as days passes on, it was realised that it was highly contagious and the mortality was also reported. The patients presented with a plethora of signs and symptoms including raised body temperature, cough, headache, nausea, vomiting, anorexia, diarrhea, dyspnea, multiple organ dysfunctions. Majority of the patients reported only mild infections and were all right after a week or two. But in a minor number of cases patients progressively develop serious complications, including sepsis, acute respiratory failure, metabolic acidosis, heart failure, kidney injury, hypoxic encephalopathy and eventually die of the illness. The study retrospectively reviewed the Case files of patients with COVID-19 and compared the hematological and biochemical characteristics between survivors and non-survivors.

Keywords: Association, survivors, non-survivors, biochemical markers

Introduction

Several things have been taken into account and have been speculated upon to find the origin of covid-19 virus. The origin of the virus was traced back to the game meat market in Wuhan, China. Some even have speculated that it was a lab leak in the famous virology lab located in the same province ^[1]. First the world did not anticipate the depth of the disease but as days passes on, it was realised that it was highly contagious and the mortality was also reported ^[2]. The patients presented with a plethora of signs and symptoms including raised body temperature, cough, headache, nausea, vomiting, anorexia, diarrhea, dyspnea, multiple organ dysfunctions ^[3]. Majority of the patients reported only mild infections and were all right after a week or two ^[4]. But in a minor number of cases patients progressively develop serious complications, including sepsis, acute respiratory failure, metabolic acidosis, heart failure, kidney injury, hypoxic encephalopathy, and eventually die of the illness ^[5]. The study retrospectively reviewed the Case files of patients with COVID-19 and compared the hematological and biochemical characteristics between survivors and non-survivors. Considering high transmission and infectivity patterns, World Health Organisation announces it as an emergency of public health concern on March 31, 2020 ^[6]. In the initial phase of the disease outbreak, the mortality ranges from 2 to 5%, much higher in the elderly ^[3]. The mortality in coronavirus cases admitted in Wuhan city reached 7% in the outbreak's initial days ^[7]. This study puts in an effort to find the association of the first biochemical parameters taken in the Emergency Department in Covid-19 patients with the outcome.

Aims and Objectives

To study the association of the first biochemical parameters taken in the Emergency Department in Covid-19 patients with the outcome.

Materials and Methods

This study was done in the Department of Anesthesiology, Srinivas Institute of Medical Sciences, Mangalore.

This study was done from May 2020 to June 2021.

The study was done in 240 patients.

The patients when landed in the Department were thoroughly examined and the blood was

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sent to the Biochemistry lab of initial evaluation. Then the comparison was made between the survivors and the non-survivors. This study would shed the light on the prognostic factors of the biochemical markers on the

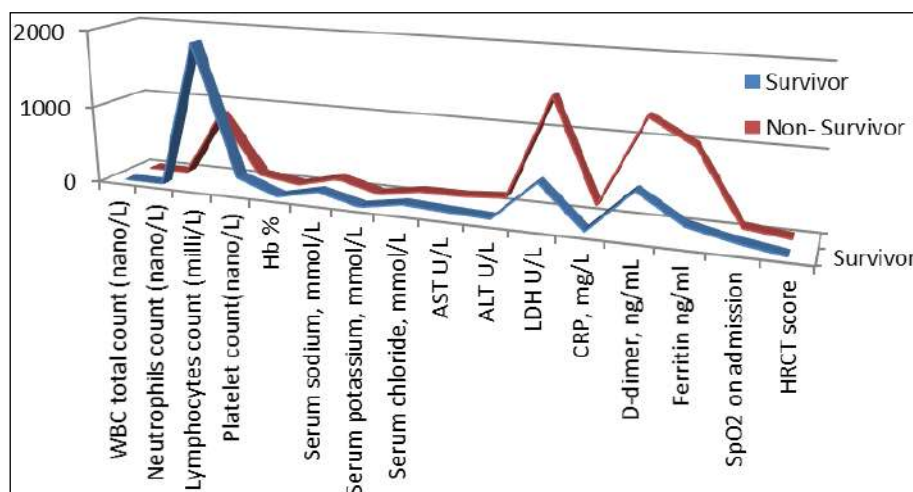
survival.

Results

Out of 240, eighteen people lost their lives

Table 1: Mean Values (rounded off to nearest one decimal point)

Markers	Survivor	Non-Survivor
WBC total count (nano/L)	4.2	7.1
Neutrophils count (nano/L)	3.1	4.5
Lymphocytes count (milli/L)	1900	850
Platelet count(nano/L)	205	86
Hb %	13.1	9.8
Serum sodium, mmol/L	137	142
Serum potassium, mmol/L	4	3.8
Serum chloride, mmol/L	98	94
AST U/L	68	95
ALT U/L	45	136
LDH U/L	550	1448
CRP, mg/L	21	164
D-dimer, ng/mL	567	1293
Ferritin ng/ml	220	990
SpO2 on admission	94	83
HRCT score	7.4	15.7



Graph 1: Show the survivor non-survivor

Table 2: Comorbidities

Comorbidities	Survivors (240)	Non-Survivors (18)
Hypertension	31	1
Diabetes	12	1
CVS	1	1
HTN plus Diabetes	09	15

Discussion

The non-survivors in comparison with the survivors had significant increases in their leukocyte, total bilirubin, creatine kinase, serum ferritin and interleukin 6 (IL-6) values and more significant decreases in their lymphocyte and platelet counts^[14]. Concerning pancreatic function, an elevation of amylase and lipase has been associated with severe cases, which is consistent with pancreatic injury evidenced by computed tomography in seriously ill patients^[15]. The elevation of serum levels of inflammatory markers is commensurate with the severity of the disease and in some cases increases up to 12 times the reference value, possibly being related to the direct damage to the hepatic tissue or as a secondary effect of the pharmacological treatment used during the hospitalization of patients that

evolve toward liver injury^[8]. For this reason, it is recommended at least to determine the levels of ALT, bilirubin and albumin during the treatment of patients with hepatotoxic medication and those with preexisting hepatic conditions^[9]. Also, the combination of eosinopenia and increased high-sensitivity C-reactive protein (hs-CRP) can serve to distinguish between patients suspected of presenting COVID-19 (supporting the diagnostic process) from patients with pneumonia or a respiratory infection similar to COVID-19^[10]. Moreover, elevated LDH is one of the most frequently altered biochemical parameters on admission^[16] and the increase of certain inflammatory cytokines (IL-2, IL-6, TNF α) during the progression stage^[12] can contribute information to the follow-up of the disease. In prior cases of pneumonia caused by SARS-CoV infection (2003), it was found that the serum levels of pro-inflammatory cytokines (IFN- γ , IL-1, IL-6, IL-12, and TGF- β) and chemokines (CCL2, CXCL9, CXCL10 and IL-8) in patients infected with SARS-CoV were higher than in healthy patients, while the level of the cytokine synthesis inhibitory factor (IL-10) in seriously ill patients was significantly lower than in healthy counterparts^[13]. In a

meta-analysis of COVID-19, several differences were observed between groups of more severe cases.

Conclusion

Biochemical markers can shed some light on the probability of survival in Covid patients who land in the Anesthesiology/critical care Department.

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