

Biomarkers with the Severity of COVID-19 Patients

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ABSTRACT

Objective: The main objective of the study is to find the association of inflammatory markers with the severity of COVID-19.

Study Design: Analytical Study

Place and Duration of Study: This study was conducted at the Al Aleem Medical College Lahore with the collaboration of LGH, Lahore during April 2020 to July 2020.

Materials and Methods: The data was collected from 200 patients, having confirm COVID-19 through real time PCR. Patients were divided into two categories, one was mild and second was severe. Those patients who have mild symptoms of COVID fall into the group A and those who was with severe condition, fall in Group B.

Results: The data was collected from 200 COVID-19 confirmed patients. The mean age of Mild group patients was 37.25±5.45 years and 50.0±6.75 years for sever group. There were 87 males and 43 females in mild group and 58 males and 12 females in severe group. There were 1.5% deaths occur due to mild symptoms of COVID-19 and 10% deaths were due to severe condition. There were 109 (83.8%) patients have fever in mild condition and 58 (82.8%) in sever condition.

Conclusion: It is concluded that most of the patients with confirmed COVID-19 has increased values of inflammatory markers.

Key Words: COVID-19, Acute, Inflammation, Mild, Markers

Citation of article: Lodhi N, Ahmad KA, Hotiana UA, Ramzan HS. Association of Inflammatory Biomarkers with the Severity of COVID-19 Patients. Med Forum 2020;31(12):154-156.

INTRODUCTION

COVID-19 is the infectious disease caused by the corona virus and directly effects on respiratory system of the human being. Results are particularly poor in patients needing progressed respiratory help, with ongoing UK data announcing a mortality of 54.4% in this gathering^[1]. Clinical disintegration frequently happens 7–10 days after the beginning of manifestations, in association with declining viral titres, recommending that pathology is driven by irritation instead of direct popular injury. Fiery markers are regularly significantly raised in patients with extreme COVID-19^[2]. Uncontrolled, self-propagating, and tissue-harming provocative action has likewise been

depicted already in the pathogenesis of other human coronavirus contaminations^[3].

Acute inflammation in the lungs is a complex pathophysiological component including provocative middle people, for example, cytokines and chemokines, which animate the macrophages in the alveoli, prompting helpless guideline of the safe system^[3]. In people, the clinical movement of the novel coronavirus-incited ailment exists in a triphasic form. The clinical highlights in first stage incorporate fever, dry hack, myalgia, and other foundational diseases that are probably going to be expanded by the replication of the virus and cell necrosis^[4]. The related element of the subsequent stage is the beginning of IgG immunoglobulins change, correlated with the lessening in viral replication. During this stage, uncontrolled viral replication happens causing serious declining of manifestations^[5]. The specific theory behind this may be the extreme harm to alveoli brought about by over rich safe reaction of the host.

In nCOVID-19-contaminated patients, the significant patient populace recouped following fourteen days, yet 33% of the patients advanced to the third stage, which is described by serious lung irritation prompting ARDS, for example acute respiratory misery syndrome^[6]. Serious adverse health result of COVID-19 contamination was discovered considerably more predominant among youngsters, particularly those underneath 12 years, the old populace, and patients with comorbid illnesses^[7].

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Received: August, 2020

Accepted: September, 2020

Printed: December, 2020

MATERIALS AND METHODS

This analytical study was conducted in Al Aleem Medical College Lahore with the collaboration of LGH, Lahore during April 2020 to July 2020. The data was collected from 200 patients, having confirm COVID-19 through real time PCR. Patients were divided into two categories, one was mild and second was severe. Those patients who have mild symptoms of COVID fall into the group A and those who was with severe condition, fall in Group B.

Data Collection: The data was collected from the wards of the hospitals. 3cc venous blood was drawn from the patients of both groups for biochemical analysis. This blood sample was used for the lab analysis of CBC, CRP, lactate and calcitonin levels. All these patients were also followed for the outcome.

Statistical Analysis: The data was collected and entered into the SPSS 19 for further analysis. All the values were presented in mean and standard deviation.

RESULTS

Table No.1: Baseline characteristics of selected participants in both groups

	Mild N=130	Severe N=70	p value
Age	37.25±5.45	50.0±6.75	0.007
Sex			0.58
Men	87 (66.9%)	58 (82.8%)	
Women	43 (33.07%)	12 (9.23%)	
Death	2 (1.5%)	7 (10%)	0.0805
Exposure to outside country	47 (36.15%)	16 (22.8%)	0.4754
Hypertension	24 (18.46%)	12 (17.1%)	0.0078
Diabetes	22 (16.9%)	12 (17.1%)	0.3374
Malignancy	0	1 (1.4%)	0.2927
Chronic liver disease	7 (5.38%)	2 (2.85%)	0.2002
Fever	109 (83.8%)	58 (82.8%)	0.8128
Cough	97 (74.6%)	57 (81.4%)	0.1289
Fatigue	92 (70.76%)	50 (71.4%)	0.0022
Nausea	5 (3.9%)	7 (10%)	
Sore throat	22 (16.9%)	7(10%)	0.9645
Shortness of breath	10 (7.69%)	4 (5.71%)	0.0078
Chest pain	0	7 (10%)	0.2927
Diarrhea	0	4 (5.71%)	0.1756

The data was collected from 200 COVID-19 confirmed patients. The mean age of Mild group patients was 37.25±5.45 years and 50.0±6.75 years for sever group. There were 87 males and 43 females in mild group and

58 males and 12 females in severe group. There were 1.5% deaths occur due to mild symptoms of COVID-19 and 10% deaths were due to severe condition. There were 109 (83.8%) patients have fever in mild condition and 58 (82.8%) in sever condition. There are other factors also, like hypertension 24 (18.46%) in mild group and 12 (17.1%) in sever group, fatigue and nausea which also contribute towards the severity of disease. Baseline values of patients were presented in table 01.

Biochemical analysis of all selected patients shows that young age people suffers from mild condition of disease as compared to old age. All the biochemical markers were increased significantly and shows the higher levels of ferritin, CRP, prolactin and Lactate in both groups. But the older group shows more increase as compared to younger age group.

Table No.2: Laboratory findings of both groups with respect to symptoms

Variables	Mild group	Severe group	P-value
Age (years)	37.25±5.45	50.0±6.75	<0.001
Ferritin (ng/mL)	309 ± 134.6	1989 ±199.9	<0.001
CRP (mg/L)	29.9 ± 45.3	64.9 ± 67.2	<0.001
Lactate (mmol/L)	1.47 ± 0.65	2.10 ± 1.81	<0.001
Prolactin (ng/mL)	0.170 ± 0.07	0.61 ± 0.31	<0.001

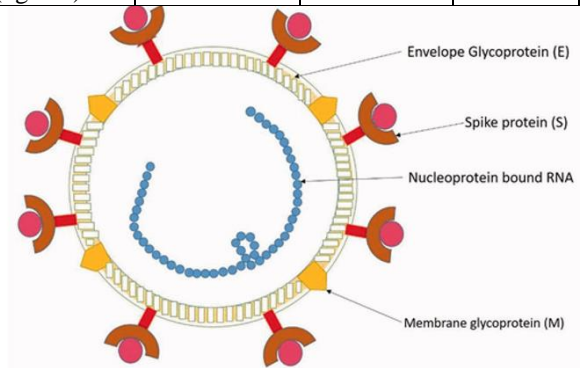


Figure No.1: Structure of novel corona Virus

DISCUSSION

COVID-19, caused by SARS-CoV-2, is rapidly expanding worldwide. Regardless of the way that most cases have gentle side effects and a decent guess, COVID-19 can form into ARDS and even demise. Until this point in time, there is no successful treatment for COVID-19 [5,6]. A few examinations have demonstrated expanded pro inflammatory cytokines in serum of COVID-19 patients. Likewise, mitigating specialists for COVID-19 treatment feature the basic part of inflammation in the movement of COVID-19 [7]. Nonetheless, the function of fiery markers in observing

the seriousness of COVID-19 is as yet dubious. In this examination, through investigating the 16 review considers, we inferred that fiery markers, particularly CRP, PCT, IL-6 and ESR, were emphatically correlated with the seriousness of COVID-19^[8].

CRP is a perfectly delicate fundamental marker of acute-stage reaction in inflammation, disease, and tissue harm, which could be utilized as pointer of inflammation^[9]. In the examination by other study, no measurably critical distinction was found in the degree of CRP between the no severe and the serious gathering, the mean degree of CRP was higher in the extreme gathering than in the no severe gathering¹⁰.

Different examinations all detailed CRP level was decidedly related to the seriousness of COVID-19. PCT is likewise a principle incendiary marker regularly estimated in clinical practice. Among investigations, the degrees of PCT were all higher in the serious gathering than the non-severe gathering¹¹. ESR is a vague incendiary marker, which primarily mirrors the progressions of plasma protein types. One explanation is that patients in the extreme gathering had higher inflammation. Another conceivable clarification is that patients with more established age in the serious gathering added to the more significant level of ESR thinking about that the degree of ESR expanded with age^[12,13].

CONCLUSION

It is concluded that most of the patients with confirmed COVID-19 has increased values of inflammatory markers. Their values were increased significantly due to disease and these increased levels of inflammatory markers directly correlates with the severity of disease. By regular analyzing and monitoring of these markers we can control the severity of disease.

Author's Contribution:

Concept & Design of Study: Naveed Lodhi
 Drafting: Kashif Aziz Ahmad
 Data Analysis: Usman Amin Hotiana, Hafiza Sobia Ramzan
 Revisiting Critically: Naveed Lodhi, Kashif Aziz Ahmad
 Final Approval of version: Naveed Lodhi

Conflict of Interest: The study has no conflict of interest to declare by any author.

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