ROLE OF INTERLUKIN-6 IN PROGNOSIS OF COVID-19 PATIENTS ON STEROID THERAPY

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ABSTRACT

Introduction: Corona virus disease– 2019 (COVID-19) is a disease that was detected in December 2019 in Wuhan, China, and led to the risk of mortality of about 2% [1]. This disease is caused due to infection with a recently arising zoonotic virus known as the Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2). **Material And Method:** Total 25 patients, suffering from Covid 19 and having severe symptoms like fever, cough, cold, breathlessness, myalgia, headache were admitted in various hospitals across the city.The blood samples were collected from these patients for IL-6 investigation. These samples were labelled as Group 1. These patients were treated with standard treatment and steroid injection for corona patients for 5 days. After that the samples were recollected and IL-6 was analysed.

Result And Conclusion: There was significant variation in IL-6 levels before and after steroid treatment. Many analysis showed that the changes in IL-6 levels were associated with severity of disease COVID-19. Higher baseline IL-6 was associated with more progressed changes in chest CT scans with clinically CT scores.Our results indicate a strong correlation between interleukin-6 levels and severity of COVID-19., we recommend that interleukin-6 levels may be used as a systemic marker of ongoing lung inflammation.

KEYWORDS :

INTRODUCTION

Corona virus disease– 2019 (COVID-19) is a disease that was detected in December 2019 in Wuhan, China, and led to the risk of mortality of about 2% [1]. This disease is caused due to infection with a recently arising zoonotic virus known as the Severe Acute Respiratory Syndrome Corona virus 2 (SARS-CoV-2) [2]. The symptoms of this disease appear with different degrees that start the first seven days with mild symptoms such as fever, cough, shortness of breath.[3]. Afterwards, critical symptoms may develop in some patients involving dyspnea and pneumonia that require patient's management in intensive care units to avoid the serious respiratory complications that may lead to death [4]. However, there are no specific symptoms to diagnose corona virus infection, and accurate testing depends on the detection of the viral genome using the reverse transcription-polymerase chain reaction (RT-PCR) analysis in nasal and post pharyngeal wall swabs. [5] At present, due to the lack of reliable marker and effective antiviral medication, the monitoring of severe cases of COVID-19 mainly relies on the observation of clinical presentation (Wangetal, 2020; Yangetal, 2020). According to previous relevant literature on viral pneumonia and the current therapeutic experience on severe type COVID-19, the cytokine storm may be the main reason for rapid disease progression and poor treatment response (Yiuetal, 2012; de Britoetal, 2016; Gupta et al, 2020). IL-6 is a pleotropic cytokine produced in response to tissue damage and infections (Tanaka et al., 2014). Multiple cell types including fibroblasts, keratinocytes, mesangial cells, vascular endothelial cells, mast cells, macrophages, dendritic cells, and T and B cells are associated with the production of this cytokine (Mauer et al., 2015). Accordingly, the biological consequences of IL-6 production have been associated with both pro- and anti-inflammatory effects (Scheller et al., 2011), highlighting IL-6's pivotal role in the activation and regulation of the immune response. Biological activities affected by production of IL-6 include: control of the differentiation of monocytes into macrophages by regulating the expression of macrophage colony-stimulating factor (Chomarat et al., 2000), increasing B-cell IgG production by regulating the expression of IL-21 (Yang et al.,2016) In addition to its role in modulating the host immune response,IL-6 has been implicated in the progression of several virus infections. IL-6 is considered one of the most important cytokines during an infection, along with interleukin 1 (IL-1) and tumor necrosis factor alpha (TNF-a; Dienz and Rincon,2009).The safety and efficacy of combination therapy of corticosteroids and an antiviral agent targeting severe acute respiratory syndrome coronavirus 2 (SARS-

CoV-2) for the treatment of COVID-19 have not been rigorously studied in clinical trials. However, there are theoretical reasons that such combination therapy may be beneficial in patients with severe disease. See Therapeutic Management of Patients with COVID-19 for the Panel's recommendations on use of steroid with or without remdesivir in certain hospitalized patients. Both beneficial and deleterious clinical outcomes have been reported with use of corticosteroids (mostly prednisolone or methylprednisolone) in patients with other pulmonary infections.

MATERIAL AND METHOD

The present data was collected from Reliable Diagnostic Centre, Jodhpur, Rajasthan. Total 25 patients suffering from Covid 19 having severe symptoms like fever, cough, cold, breathlessness, myalgia, headache were admitted in various hospitals across the city.

Study Period-

The blood sample were collected from these patients and were sent to Reliable Diagnostic Centre for IL-6 investigation. These samples were labelled as Group1. These patients were treated with standard treatment and steroid injection for corona patients for 5 days. After that the samples were recollected and IL-6 was analysed.

Inclusion Criteria:

Patients who were diagnosed and confirmed with corona, having symptoms like fever, cough, cold, breathlessness, myalgia, headache.

Exclusion Criteria:

Patients who are smokers or are suffering from chronic disease of pulmonary, renal and cardiovascular system.

Data Analysis:

Mean and Standard Deviation **&** Student's T- test

Observation Table

PARAMETER	GROUP 1 Before	GROUP 2 after	STUDENT' TTEST p value
Interleukin 6	623.33±298.31	26.45±18.02	<0.0000001(HS)

This Table showing the comparison of IL-6 test in between Covid Patients before and after Steriod treatment. The result showed that **Il-6** after Steriod therapy significantly decreased.
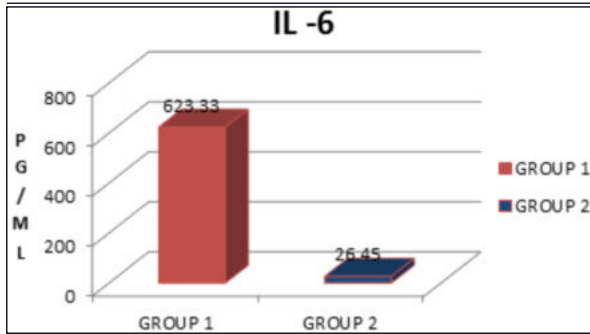
This Resulted In Exponential Reduction In The Values Of IL-6 Associated With Symptomatic Relief.

DISCUSSION:

The present data was collected from Reliable Diagnostic Centre, Jodhpur, Rajasthan. Total 25 patients suffering from Covid 19 having severe symptoms like fever, cough, cold, breathlessness, myalgia, headache were admitted in various hospitals across the city. IL-6 is a pleotropic cytokine produced in response to tissue damage and infections (Tanaka et al., 2014). Multiple cell types including fibroblasts, keratinocytes, mesangial cells, vascular endothelial cells, mast cells, macrophages, dendritic cells, and T and B cells are associated with the production of this cytokine (Mauer et al., 2015). There was significant variation in IL-6 levels before and after steroid treatment. Many analysis showed that the changes in IL-6 levels were associated with severity of disease COVID-19. Higher baseline IL-6 was associated with more progressed changes in chest CT scans with clinically CT scores. Consistently, severe COVID-19 patients who needed more intensive care and treatment, probably due to more severe lung damage, showed higher baseline IL-6 level.

SUMMARY AND CONCLUSION:

In this study, CRP, ferritin, IL-6, and LDH decreased significantly after recovery. In association with disease progression evidenced by exacerbating pulmonary lesions on chest CT scan, IL-6 increased to a further degree. Collectively, our results suggest that IL-6 might be a valuable candidate for monitoring severe type COVID-19. Since our results indicate a strong correlation between interleukin-6 levels and severity of COVID-19., we recommend that interleukin-6 levels may be used as a systemic marker of ongoing lung inflammation and may well be used as a good prognostic marker of future COVID-19 outcomes and similar viral disease affecting the pulmonary system.

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