



A RETROSPECTIVE ANALYSIS OF GENDER BASED DIFFERENCES IN D-DIMER AND IL-6 VALUES IN COVID-19 PATIENTS AMONGST GENERAL POPULATION

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ABSTRACT

Coronavirus Disease 2019 is primarily a respiratory illness that can cause thromboinflammatory disorder. Elevation of D-dimer and IL-6 are potential biomarkers for poor prognosis in COVID-19, though optimal cutoff value for D-dimer to predict mortality has not yet been established. This study aims to assess any statistically significant difference between D-dimer and IL-6 values amongst male and female patients matched for age and socioeconomic status. D-dimer and IL-6 data from patients between time periods of 15 april to 20 may 2021 was used. The study has been done under the ethical standard of the institution. Risk factors were analyzed among 52 participants. Cases were patients with COVID-19 confirmed by RT-PCR or Rapid Antigen Test (RAT). Statistical test used for analysis was Fisher's exact test. Results obtained and analyzed were found to be inconclusive in our study, however further studies with larger sample size are required for coming to any definitive conclusion. Further research is required for the proper understanding of gender based immune differences and its interaction with covid-19 infection.

KEYWORDS : Covid-19, D-dimer, IL-6 , Thromboinflammatory

INTRODUCTION

COVID- 19 pandemic inflicted a huge toll on humanity in terms of mortality, economic loss and psychological stress. While the quest for its treatment and vaccine continues, management of patients actively infected by it is imperative. COVID-19 progresses to "atypical" acute respiratory distress syndrome (ARDS). Raised levels of coagulation parameters indicate thrombotic disorders which need to be managed as soon as possible. D-dimer is a widely used fibrin degradation product test used for initial diagnosis of thrombotic disorders. Studies have shown that a fourfold increase in its levels is a strong indicator of mortality in active COVID-19 cases (1).

Interleukin 6 (IL-6) and other components of the inflammatory cascade contribute to host defense against infections. However, excessive synthesis of IL-6 can lead to a severe acute systemic inflammatory response known as a "cytokine storm," which confers increased risks of vascular hyper permeability, multiorgan failure, and eventually death. Many studies, suggests that higher IL-6 levels may be an important predictor of COVID-19 severity. However, the role of IL-6 as an independent predictor of severity and mortality in hospitalized COVID-19 patients has not been validated (2).

Many theories have been proposed to explain differences between prognosis of covid-19 in male and female patients including the protective role of estrogen, ACE2 gene expression on the X chromosome, and more robust immune activation in women. Epidemiological studies have consistently demonstrated more exuberant immune responses in women compared with men. The prevalence of autoimmune disease is far higher in women than men in the general population. Despite a growing body of evidence supporting sex differences in immune response, the reason for inflammation contributing to COVID-19 disease severity in men vs women is not known. In this study we have tried to outline the practical validity of these theories. (3,4)

The purpose of this study was to 1) determine the gender related differences in thrombotic (d-dimer) and

inflammatory(IL-6) parameters during Covid-19. 2) To assist in effective treatment plan as well as policy making plan in future.3) To analyze interaction of immune system with covid-19 infection and the unique gender associated differences in the same.

MATERIAL AND METHOD

This cross sectional study was conducted on total of 52 covid positive participants who were divide based on gender with a sample size of 26 in each group. D-dimer and IL-6 values of these patients were collected during 15 april to 20 may 2021. The study was approved by the ethical committee of the institution.

Cases beyond the age of 18years and those with confirmed RT-PCR or Rapid Antigen Test (RAT) positive due covid-19 were recruited for the study while those who did not give consent or those with comorbidities like hypertension, diabetes, bleeding disorders or any other inflammatory allergic and autoimmune diseases were excluded from our study.

Statistical Analysis: Study categorical variables were compared using Fisher's exact test and P-value of <0.05 was considered statistically significant.

RESULT

Variables	Covid Positive Male (N=26)	Covid Positive Female (N=26)	P-Value
D-dimer	9(34.71%)	8(30.76%)	0.22
IL-6	26(100%)	22(84.61%)	0.05

DISCUSSION

Our study was conducted on 52 patients amongst whom 26 were males and 26 were females matched for age and socio economic status. P value for difference between D-dimer level amongst males and females was 0.222. P value for difference between IL-6 levels amongst males and females was 0.055. Based on our data we didn't find any statistically significant difference in immune response of patients based on their gender. Though some theories are there which predict greater

immune response amongst covid-19 female patients compared to males but in our study we could not find any statistically significant proof of the same.

Major pitfalls of this study were course of the disease was not included, limited sample size and collection and analysis of the data were done at an early stage of the disease. Longer period of surveillance and larger sample size would be required to draw some significant conclusions towards the aims and objects of the study.

CONCLUSIONS

Within the limitation of our study, we can conclude that inflammatory disorders are closely related to the severity of covid-19. Further research is required for the proper understanding of gender based immune differences and its interaction with covid-19 infection and to signify the essence of D-dimer and IL-6 being the promising therapeutic targets.

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