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Original Research Article

ASSESSMENT OF D. DIMER VALUE IN COVID-19 INFECTED PATIENTS

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Abstract: *A global catastrophe caused by the COVID-19 epidemic has had negative effects on both health and the economy. The coagulation system may be involved in the pathophysiology of COVID-19 since D-Dimer, a measure of hypercoagulability, is higher in COVID-19 individuals with severe illness. In order to determine whether there is a relationship between D-Dimer levels and disease severity, this study measured the levels of D-Dimer in COVID-19 patients with severe and non-severe disease. The average age of the 72 confirmed COVID-19 patients in the research was 52.85 10.65. Based on the severity, the individuals were split into two groups, and the levels of D-Dimer were measured in each group. In contrast to individuals with less severe symptoms, those with severe COVID-19 symptoms had considerably higher levels of D-Dimer, according to the study. Cough, fever, breathing difficulties, and gastrointestinal symptoms were also discovered in the study to be statistically significant in patients with severe symptoms. The most prevalent co-morbid conditions among the individuals were hypertension and diabetes. These results emphasise the significance of identifying patients at risk for poor outcomes, tracking their D-Dimer levels and suggesting that D-Dimer levels may be a helpful prognostic marker in COVID-19 patients.*

Introduction

COVID-19 is a contagious illness caused by the novel coronavirus, SARS-CoV-2, which was first identified in Wuhan, China, in December 2019 (Williams et al., 2021). The disease has spread rapidly worldwide and is now considered a global pandemic. COVID-19 symptoms range from mild flu-like symptoms to severe respiratory distress and multi-organ failure (Zaim et al., 2020).

D-dimer, a degradation product of fibrin, is a commonly used marker for hypercoagulability (Chandel et al., 2021). Higher levels of D-dimer have been linked to a greater risk of thromboembolic events such as deep vein thrombosis, pulmonary embolism, and stroke. Studies have reported elevated levels of D-dimer in patients with severe COVID-19, indicating that hypercoagulability may play a role in the disease's pathogenesis (Demelo-Rodríguez et al., 2020). Monitoring D-dimer levels in COVID-19 patients is an essential tool for managing the disease (Vidali et al., 2020). Elevated D-dimer levels have been linked to more severe illness and poor outcomes, including mortality. As a result, keeping track of D-dimer levels adjusting their care accordingly (Zhan et al., 2021).

This research aims to assess the D-dimer levels in COVID-19 patients with severe and non-severe illness and investigate the relationship between D-dimer levels and disease severity. The study aims to determine the clinical importance of D-dimer levels in COVID-19 patients and determine whether they can be used as a prognostic marker for managing the disease. By examining the correlation between D-dimer levels and illness severity, this research hopes to improve our understanding of COVID-19's pathogenesis and identify potential therapeutic targets. Furthermore, by identifying D-dimer levels as a prognostic marker, this study aims to improve COVID-19 patient care by allowing physicians to identify high-risk patients and tailor their treatment.

Material and methods

The present study aimed to conduct a comparative analysis of confirmed COVID-19 cases at Bahria Town International Hospital Lahore between September 17, 2021, and September 19, 2022. The study comprised a total of 72 participants of both genders, categorized into two groups based on the severity of the disease. Group NS included

participants with mild to moderate cases of COVID-19, while Group S comprised only severe cases, as per the clinical classification of the WHO interim guidance. The participants' demographic and co-morbid condition data were collected and analyzed. Furthermore, D-dimer levels were evaluated in both groups to assess the potential association between the severity of COVID-19 and D-dimer levels. The data was analyzed using the statistical software SPSS version 25, and a p-value less than 0.05 was considered statistically significant.

Results

A total of 72 confirmed covid-19 patients were included in this study. The mean age of the participants was 52.85 ± 10.65. There were 39 males and 33 females. In group NS, a total of 36 participants were included. The average hospital stay in both groups showed no significant difference (14.00 ±5.71vs 18.44 ±5.55, p= 0.75) Table 1. The symptoms of cough, fever, difficulty in breathing, and gastrointestinal symptoms were statistically significant in Group S compared to Group NS (p= 0.05, 0.04, 0.04., 0.01 respectively) Table 2. The participants' most common co-morbid condition was hypertension, followed by diabetes (52.78% and 20.83%, respectively). The comparison of both groups is shown in Table 3. The mean value of D. Dimer I group NS was 206.14 ± 69.65; in Group S, it was significantly very high, 2665.40 ± 956.65 (p < 0.001) Figure 1.

Table 1: Demographics of the study population:

Demographic	***N (%)***	**Group NS (Mild to moderate)**	**Group S (Sever)**	**P-value**
Total	*72*	36	36	
Age (Years)				
less than 60	*39*	18	19	0.52
Greater than 60	*33*	16	17	
Mean age	*52.85 ± 10.65*	54.50 ± 9.44	62.85 ± 6.54	0.006
Sex				
Male	*39*	18	21	0.88
Female	*33*	16	17	
Average hospital stay (days)	13.16 ±5.56	14.00 ±5.71	18.44 ±5.55	0.75

Table 2: Clinical characteristics of the study population:

Clinical characteristics	***N***	***(%)***	**Mild to moderate**	**Sever**	**P**
Fever	*58*	80.56	22	36	0.05
Cough	*51*	70.83	19	32	0.04
Chest tightness	*28*	38.89	16	12	0.79
Difficulty breathing	*27*	37.50	9	19	0.04
Gastrointestinal symptoms	*12*	16.67	3	9	0.01

Table 3: Co-morbid conditions of the study population:

Co morbid conditions	***N***	***(%)***	**Mild to moderate (NS)**	**Sever (S)**	**P- value**
Hypertension	*38*	52.78	12	26	0.001
Diabetes	*15*	20.83	7	8	0.41
Renal insufficiency	*2*	2.78	1	1	0.114
Cerebrovascular disease	*6*	8.33	1	5	0.004
Malignant tumor	*2*	2.78	0	2	0.5
Surgical history	*5*	6.94	2	3	0.16

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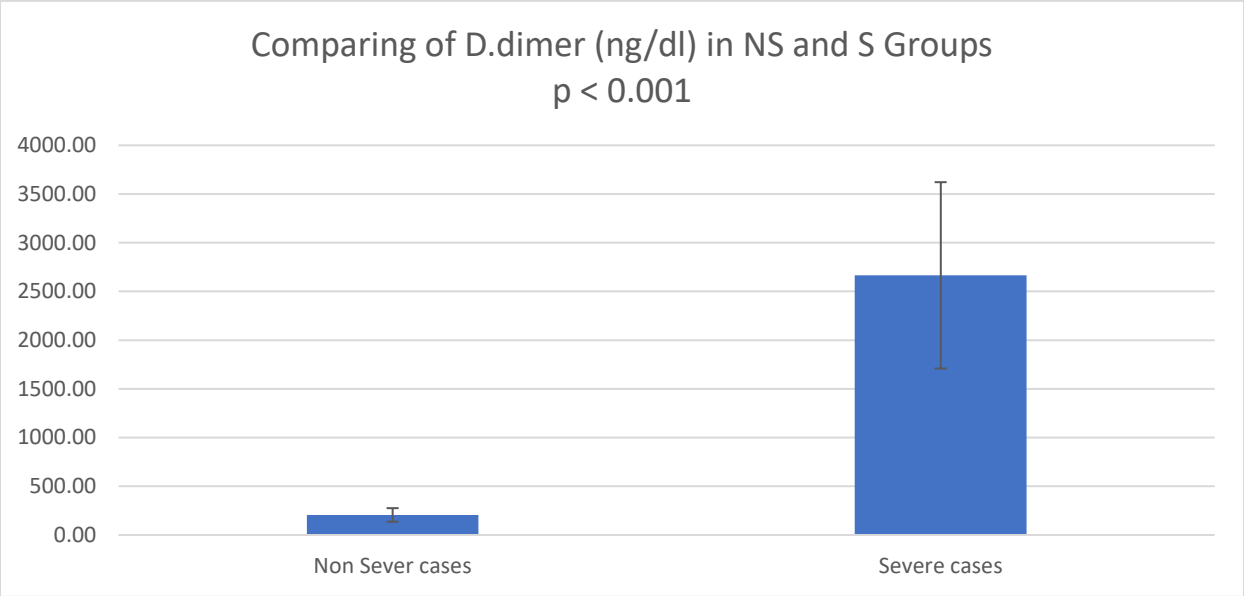

Figure 1 comparing Non-servers with the Serve group of COVID-19 infection:

Discussion

Two groups of COVID-19 patients were compared in the study, one with severe symptoms (Group S) and the other with mild to moderate symptoms (Group NS). The average age of the 72 confirmed COVID-19 patients in the research was 52.85 10.65. According to the study, there was a statistically significant difference between Group S and Group NS in terms of cough, fever, respiratory difficulties, and gastrointestinal problems. Diabetes and hypertension were the two co-morbid conditions that affected the subjects the most frequently. The study also discovered that Group S's mean D-Dimer value was substantially greater than Group NS's.

It is consistent with earlier research that found a link between high D-Dimer levels and poor outcomes in COVID-19 patients that individuals with severe symptoms had higher levels of D-Dimer (Cheng et al., 2020; Gungor et al., 2021; Li et al., 2020). In COVID-19 patients with severe illness, the fibrin degradation product D-Dimer—a sign of hypercoagulability—is increased. This shows that D-Dimer levels may be a helpful prognostic marker in COVID-19 patients and that the coagulation system may be involved in the aetiology of the disease.

It is consistent with earlier research that found these illnesses to be risk factors for severe COVID-19 disease that hypertension and diabetes were the most prevalent co-morbid conditions among the subjects (Arumugam et al., 2020; Moazzami et al., 2020; Song et al., 2021; Yang et al., 2021). The average length of stay in the hospital between the two groups did not significantly differ, according to the study. This might be as a result of the small sample size and the fact that factors other than the intensity of symptoms affect hospital stay.

The study's limited sample size is one drawback, which would limit how far the results can be applied. The study also failed to mention the patients' treatment regimens, which would have affected the results.

Conclusion

In conclusion, this study found that patients with severe COVID-19 symptoms had higher levels of D-Dimer and a higher prevalence of cough, fever, difficulty in breathing, and gastrointestinal symptoms. Additionally, hypertension and diabetes were the most common co-morbid conditions among the participants. These findings are consistent with previous studies and highlight the importance of identifying patients with these risk factors and monitoring their D-Dimer levels as a prognostic marker. Further studies with larger sample sizes are needed to confirm these findings and explore treatment modalities' role in influencing outcomes in COVID-19 patients.

Conflict of Interest

The authors declared absence of conflict of interest.

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