Original Research Article

Relationship of D dimer and platelets in Covid 19 patients - Cross sectional study

Dr. Sonam Dubey[1] (Assistant Professor), Dr. Sunita Bika[2] (Associate Professor) & Dr. Kavita Sharma[3] (Senior Demonstrator)

Department of Pathology, Birsa Munda Medical College, Shahdol[1]
S. P. Medical College Bikaner[2&3]

Corresponding Author: Dr. Kavita Sharma

Abstract:
Background & Method: The aim of the study is to study Relationship of D dimer and platelets in Covid 19 patients. The D-dimer sample was analyzed using the Cobas Analyzer series, and the platelet sample was analyzed using the sysmex KX-21 hematolyzer.
Result: The research sample obtained as many as 100 samples taken by purposive sampling technique. The test results using the Spearman's correlation test with = 0.05 showed no significant relationship between D-dimer levels and platelet count (r = -0.72, P = 0.488).
Conclusion: Elevated D-dimer levels are not directly proportional to the condition of thrombocytopenia which is an indication of severity in COVID-19 patients. Further research is suggested to be able to analyze the parameters of other examination results in COVID-19 patients that lead to the condition of patients who do not survive such as inflammatory marker parameters. D-dimer mean values, thrombocytopenia, and prolonged coagulation factors were significantly affected by COVID-19 disease, particularly in critical and severe cases associated with a poor prognosis.

Keywords: D dimer, platelets & Covid 19.

Study Designed: Cross sectional Study.

1. Introduction

Coronavirus disease 2019 (COVID-19), caused by the Severe acute respiratory syndrome coronavirus 2, was first recorded in Wuhan, the capital of Hubei province of China in December 2019 [1]. While COVID-19 is primarily a respiratory illness, it can affect multiple organ systems including gastrointestinal, hepatic, cardiac, neurological, and renal systems [1–3].
Examination of D-dimer and platelets in COVID-19 patients is very important, especially to assess the severity of the disease and the risk of not surviving in these patients. The D-dimer value is used to assess the occurrence of the coagulation process in COVID-19 patients, while the platelet count is calculated to see the risk of thrombocytopenia[4].
D-dimer is a fibrin degradation product, widely used as a biomarker for thrombotic disorders. A D-dimer value less than 0.5 μg/mL is usually considered normal, and values increase with increasing age and in pregnancy. The level of D-dimer rises with increased severity of

community-acquired pneumonia [5]. Following the outbreak of the COVID-19 pandemic, Ddimer has been identified as a potential indicator for its prognosis in COVID-19 patients.

Admission day D-dimer has shown promise for predicting the disease severity in multiple studies [6–9]. Accurate and widely available prognostic biomarkers can be very useful in the management of COVID-19. This multi-centre study aims to assess elevation in D-dimer at the time of admission as a possible prognostic indicator of mortality in COVID-19 patients. The cutoff value used for D-dimer shows significant variation between the published studies, and there seems to be no consensus yet on what the best cut-off value is to predict severity or mortality. We thus aim to establish the optimal cut-off value for D-dimer that can be used clinically for predicting mortality in COVID-19 patients.

The novel Coronavirus disease-19 (COVID-19) aggressively spread throughout the world across various strains. Human-to-human transmission is obtained through contact with infected person droplets[10].

2. Material & Method

The D-dimer sample was analyzed using the Cobas Analyzer series, and the platelet sample was analyzed using the sysmex KX-21 hematolyzer. This research is analytic retrospective with cross sectional approach. The data source comes from the results of the examination of COVID-19 patients at Tertiary Care Centre for 01 Year.

Inclusion Criteria: Adults (aged 18 years or older) diagnosed with COVID-19 by Reverse transcription polymerase chain reaction (RT-PCR). Asymptomatic cases with Peripheral oxygen saturation (SpO2) less than 94% and symptomatic cases were consecutively enrolled in the study.

Exclusion criteria: Included cases without recorded D-dimer values at admission, presence of other infections, prior anticoagulant use, and deep vein thrombosis/ pulmonary embolism (DVT/PE), and cases without recorded definitive outcomes (death or survival).

All demographic, clinical, and outcome data were extracted from the patients' hospital record files. Demographic characteristics of patients (age, sex, and ethnicity), D-dimer on admission, SpO2 on admission, length of hospital stay, and outcome were recorded for each patient. All data were recorded in a standardized data collection form using standard units for measurement and verified by four physicians, one from each centre.

3. Results

Table 1: Characteristics

Age (Years)	No.	Percentage
20-30	05	05
31-40	17	17
41-50	19	19
51-60	31	31
61-70	17	17
71-80	11	11

Table 2: Coronavirus disease-19 patient's pattern of symptoms on admission and the outcomes of the patient's

	PLTs count	D-dimer
ICU and deceased patients	219.78±108.00	1.47±0.75
Recovery patients	251.25±101.94	0.95±0.72

Table 2: Laboratory Examination Results

	Average	Normal
D-dimer (ug/ml)	2.15	0/100
Platelets (10^3 mm^3)	252.47	89/100

The test results using the Spearman's correlation test with = 0.05 showed no significant relationship between D-dimer levels and platelet count (r = -0.72, P = 0.488).

4. Discussion

The novel COVID-19 disease and its rapidly spreading mutations are characterized by a wide severity range from asymptomatic to critical and even death. Monitoring coagulopathy and early detection of coagulation laboratory biomarker abnormalities is essential for the prediction and prognosis of disease severity among hospitalized patients and could help the improvement of clinical outcomes of COVID-19 patients[11]. Elevated D-dimer and abnormal PT and aPTT have been used as coagulating factors for the early detection of DIC and indicated a hyper coagulation and higher risk of thrombosis[12]. Furthermore, thrombocytopenia is associated with thromboembolic complication risk reported among severe COVID-19. The infected patients' mean age was 51.66 years old, which was consistent with mean ages mentioned in previous studies reported that COVID-19 infection dominated among the older population and was lower among the young population[13]. The age factor was found to be highly significant, to the tune of 9.85 times higher among older patients (p<0.006). However, older age was recorded as one of the features associated with increased chance of death [14]. This study confirmed that 76.8% of patients were males and 23.2% were females consistent with previous studies that observed male predominance and higher susceptibility among those with older age. Females' low susceptibility to COVID-19 infection may be attributed to their stronger immune response[15]. Approximately 59.9% of the COVID-19 patients group attended hospital with moderate, severe, or critical symptoms, which may be related to their weak immune response and older age, as reported in previous studies[16]. A total of 45 (40.1%) COVID-19 patients were admitted with asymptomatic or mild symptoms, which may consistent with some reports that recorded a higher rate of asymptomatic and mild symptoms among patients at hospital admission[17]. In addition, the most observed symptoms were cough, fever, shortage of breath, and taste and smell disorders, which was in line with the findings of other studies. D-dimer mean values were found to be elevated versus those of non-COVID-19 patients, with a higher significance among deceased and ICU patients[18].

5. Conclusion

Elevated D-dimer levels are not directly proportional to the condition of thrombocytopenia which is an indication of severity in COVID-19 patients. Further research is suggested to be able to analyze the parameters of other examination results in COVID-19 patients that lead to the condition of patients who do not survive such as inflammatory marker parameters. D-dimer mean values, thrombocytopenia, and prolonged coagulation factors were significantly affected by COVID-19 disease, particularly in critical and severe cases associated with a poor prognosis.

6. References

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