Levels of D-Dimer and Inflammatory Markers of COVID-19 Patients

Sir,

COVID-19 is an infectious disease caused by severe acute respiratory corona virus-2 (SARS-CoV-2). Symptoms of COVID-19 are variable but often include fever, cough, fatigue, breathing difficulties, and loss of smell and taste. Symptoms begin 1–14 days after exposure to the virus.[1] Of those people who develop noticeable symptoms, most (81%) develop mild-to-moderate symptoms (up to mild pneumonia), while 14% develop severe symptoms (dyspnea, hypoxia, or more than 50% lung involvement on imaging), and 5% suffer critical symptoms (respiratory failure, shock, or multiorgan dysfunction).[1] Rates of cardiovascular symptoms are high, owing to the systemic inflammatory response and immune system disorders during disease progression, but acute myocardial injuries may also be related to angiotensin-converting enzyme 2 receptors in the heart.[2] Blood vessel dysfunction and clot formation (as suggested by high D-dimer levels caused by blood clots) are thought to play a significant role in mortality, incidences of clots leading to pulmonary embolisms, and ischemic events within the brain have been noted as complications leading to death in people infected with SARS-CoV-2.[3] There is a paucity of report of the levels of D-dimer and inflammatory markers in our locality. In this report we present the values of D-dimer and inflammatory biomarkers (C-reactive protein [CRP], Interleukin [IL]-6) at point of admission of COVID-19 patients at a private treatment center (EMMCC) in Abuja, Nigeria. Ethical approval letter was provided by ethics committee of this hospital with the letter AB1234/COV/RAF. All patients provided verbal or written consent before inclusion in the study. This study was carried out in the period September, 2020–January 2021. Fifty polymerase chain reaction confirmed cases of COVID-19 were recruited for this study, 20 apparently healthy individuals were included as controls. D-dimer and CRP levels were determined using Finecare Immunossay analyzer while IL-6 was determined using ELIZA (Aviscera Bioscience, Santa Clara, United States). The reference range for the test methods for D-dimer is 0–0.5 mg/L, CRP 0–10.0 mg/L, and IL-6 0.31–20 pg/mL, respectively. On admission, levels of D-dimer, CRP, and IL-6 were significantly higher among COVID-19 patients when compared to healthy controls [Table 1]. The result of this study shows that D-dimer and inflammatory markers could serve as early biomarkers for proper management of COVID-19 patients. D-dimer has been found to predict poor prognosis and increased in-hospital mortality of COVID-19 patients.[4,5] In cohort analysis, CRP and IL-6 have been incriminated as strong discriminators for severe and fatal outcomes of COVID-19 disease.[6] It is essential to incorporate D-dimer, CRP, and IL-6 in routine biochemical workup for patients admitted for COVID-19. This will help to aid risk stratification of patients and proper patient management.

Table 1: D-dimer and Inflammatory markers levels in coronavirus disease 2019 patients

Parameters	Mean±SD		*P*
	COVID-19 patients	Controls	
D-dimer (mg/L)	13.98±7.5	0.09±0.08	<0.0001
CRP (mg/L)	97.98±33.2	2.34±2.6	<0.0001
IL-6 (pg/Ml)	56±21.8	15.1±3.9	<0.0001

SD: Standard deviation, IL-6: Interleukin 6, CRP: C-reactive protein

Financial support and sponsorship

This study was financially supported by MDS Molecular Services, Grant number MDS346ORTD-COVID, Young researcher grant to the First author.

Conflicts of interest

There are no conflicts of interest.

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References

1. Li YC, Bai WZ, Hashikawa T. The neuroinvasive potential of SARS-CoV2 may play a role in the respiratory failure of COVID-19 patients. J Med Virol 2020;92:552-5.
2. Zheng YY, Ma YT, Zhang JY, Xie X. COVID-19 and the cardiovascular system. Nat Rev Cardiol 2020;17:259-60.
3. Zhang C, Wu Z, Li JW, Zhao H, Wang GQ. Cytokine release syndrome in severe COVID-19: Interleukin-6 receptor antagonist Tocilizumab may be the key to reduce mortality. Int J Antimicrob Agents 2020;55:105954.
4. Zhang L, Yan X, Fan Q, Liu H, Liu X, Liu Z, *et al.* D-dimer levels on admission to predict in-hospital mortality in patients with Covid-19. J Thromb Haemost 2020;18:1324-9.

5. Qin ZJ, Liu L, Sun Q, Li X, Luo JF, Liu JS, *et al.* Impaired immune and coagulation systems may be early risk factors for COVID-19 patients: A retrospective study of 118 inpatients from Wuhan, China. Medicine (Baltimore) 2020;99:e21700.
6. Henry BM, de Oliveira MH, Benoit S, Plebani M, Lippi G. Hematologic, biochemical and immune biomarker abnormalities associated with severe illness and mortality in coronavirus disease 2019 (COVID-19): A meta-analysis. Clin Chem Lab Med 2020;58:1021-8.

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Quick Response Code:

Website: https://journals.lww.com/mtsm

DOI: 10.4103/mtsm.mtsm_5_21

How to cite this article: Adole MO, Osazuwa F. Levels of D-dimer and inflammatory markers of COVID-19 patients. Matrix Sci Med 2024;8:23-4.

Received: 25-02-2021, **Revised:** 21-01-2022,
Accepted: 11-04-2022, **Published:** 21-02-2024