Use the biomarker as D-dimer, CPR and Ferritin as byproducts in COVID-19 patients

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Abstract

The number of COVID-19 patients has increased dramatically worldwide. And healthy care can not be control Therefore, early recognition of severe forms is absolutely essential for timely triage of patients. While the clinical condition, for particular levels of oxygen saturation, and co morbidities associated with COVID-19 patients largely determine the need for admission to intensive care units, several laboratory parameters may facilitate assessment of disease severity. Physicians should take into account low lymphocyte counts as well as serum levels of CRP, D-dimers and ferritin, which can be used in the risk strata to predict severe and fatal COVID-19 in non hospitalized patients. The course of the disease is more likely to be unfavorable if some or all of these parameters are changed.

Key words

D-dimer, CPR , Ferritin **,** COVID-19.

Introduction

Corona virus disease (COVID-19) is the disease caused by 2019-nCoV / SARS-CoV-2 [1]. Presentations include fever, cough, shortness of breath, watery diarrhea, muscle pain, severe lymphatic epiphysis, prolonged clotting characteristics, heart disease, and sudden death so The disease ranges from mild or asymptomatic infections to acute respiratory infections in humans, such as those seen in severe acute respiratory syndrome and Middle East respiratory syndrome[2,3]. early diagnosis of pneumonia can be CRP levels [4], and patients with severe pneumonia had high CRP levels. It is an important index for the diagnosis and assessment of severe pulmonary infectious diseases [5]. by factors such as age, sex, and physical condition, CRP levels are correlated with the level of inflammation [6]. CRP levels can be used for the early diagnosis of pneumonia so it can activate supplementing CRP levels and enhance phagocytosis, thus cleansing disease-causing microorganisms that

invade the body. [3]. Coagulopathy such as D-dimer elevations are seen in 3.75-68.0% of COVID-19 patients. [2, 7, 8]. The changes include opacity of the milled glass, incomplete consolidation, alveolar secretions, and intra-lobular involvement, which ultimately leads to a prediction of degradation [9]. In addition to known risk factors such as aging and underlying comorbidities - particularly cardiovascular disease, diabetes, respiratory disease, and other conditions, several markers that modulate the course of COVID-19 have been identified [10]. COVID-19 caused by SARS-CoV-2 was declared as a public health emergency on January 30, 2020. The outbreak was declared as a pandemic on March 11, 2020, by the World Health Organization (WHO). The primary mode of spread is through close contact and via respiratory droplets produced from coughs or sneezes. The SARS-CoV-2 main target is binding to the angiotensin-converting enzyme 2 (ACE2) receptors, which are most commonly present in the lung, kidney, and gastrointestinal tract [11]. SARS-CoV-2 infection, especially in older patients and those with pre-existing illness, can progress to severe disease with critical respiratory symptoms. Therefore, early recognition of severe forms of COVID-19 is essential for the timely triaging of patients [12]. Under hyperferinemia, Ferritin is a critical mediator in immune dysregulation, as it contributes to a cytokine storm by direct immunosuppressive and inflammatory effects. [13]. Hyper ferritinemia or elevated levels of ferritin, , indicate the bacterial or viral load in the body. Hyper ferritinemia, or hyper ferritinemic syndrome, is a condition activating macrophages to secrete cytokines, causing a cytokine storm in severe cases, which can be a sign of severe disease [14]. The fatal outcomes by COVID-19 are accompanied by cytokine storm syndrome. It is thereby reported that disease severity depends on the cytokine storm syndrome. This cytokinestorm can positively be assessed by evaluating the serum ferritin levels [15]. Serum ferritin levels might be a crucial factor influencing the severity of COVID-19. Many individuals with diabetes exhibit elevated serum ferritin levels, facing a higher probability of experiencing severe complications from COVID-19 [16]. The median values of serum ferritin levels from a few recent studies exceeded the upper limit of detection in the COVID-19 patients during all the days of hospitalization, suggesting that ferritin levels increased incessantly throughout the hospital stay [17].

Methods:

Laboratory and imaging methods

Complete blood count (CBC), coagulation profile (Pt, PTT), kidney and liver function, creatine kinase, electrolytes, ferritin, C-reactive protein, and procalcitonin were routinely collected upon admission. The level of D-dimer is tested with an immunohistochemical turbidity assay with a reference range from 0 to 0.5 mg / L (Sysmex, CS5100).

Result and discussion:

In this study, we assessed the correlation between serum ferritin, CRP, D-dimer and severity and mortality of COVID-19 and treatment outcome with dexamethasone and vitamin C in COVID-19 positive patients. We aimed to evaluate the serum concentrations of ferritin and correlate it with the clinical outcomes.

Table (1): Show collect data of CRP, D-Dimer and Ferritin of different patients.

Patents (Weeks)	CRP			D-Dimer mg/L			Ferritin		
	1th	2sec	3rd	1th	2sec	3rd	1th	2sec	3rd
1 (Female)	42	24	12	0.27	0.42	0.56	600	450	100
2 (Male)	24	12	6	0.52	0.32	0.21	320	100	75
3 (Male)	48	42	24	0.65	0.42	0.10	600	410	85
4 (Female)	30	18	12	0.32	0.21	0.11	340	200	120
5 (Male)	54	48	30	0.27	0.13	0.4	500	390	120
6 (Female)	60	24	12	0.18	0.1	0.05	240	175	70
7 (Male)	54	30	24	0.71	0.53	0.20	290	140	92
8 (Female)	24	12	6	0.53	0.32	0.10	170	45	17
9 (Male)	48	30	12	0.57	0.13	0.09	512	320	102
10 (Male)	42	30	24	0.43	0.32	0.04	250	145	65

storage protein (Ferritin) was involved in iron metabolism, which contains L and

H subunits expressed in lung and heart, respectively. Subunit H includes the inflammatory mechanism by participating in myeloid and lymphocyte proliferation and stimulating TIM-2, Specific ferritin receptors. H-ferritin plays a major role in immune and inflammatory activities by activating several inflammatory mediators such as IL-1β. Ferritin is only present in lymph node B region, indicating its role as an antigen, which stimulates macrophage activation associated with hyperferinemia [8]. Possible mechanisms include increasing ferritin synthesis by stimulating inflammatory cytokines such as tumor necrosis interleukin-6 (IL-6),factor alpha (TNF-α), and IL-lβ. This leads to increased inflammation, which causes cell damage and the secretion of ferritin [9]. It was found that patients with hyperproteinemia had an increased mortality risk. It is not clear if it was a coincidence or due to a viral disease . we focused on serum ferritin activities as a biomarker of SARS-CoV-2 infection among COVID-19 patients. The efficacy of serum ferritin was significantly increased in patients who were unable to survive the treatment compared to patients who had finally recovered from the infection. This could be attributed to more severe secondary bacterial infection and increased inflammation exacerbating COVID-19. Causes of increased ferritin can be due to viral or bacterial infection, hemochromatosis, and long-term blood transfusion [11]**.** So in the table (1) ,show the ferritin high in first weak after that decrease in second and
third.

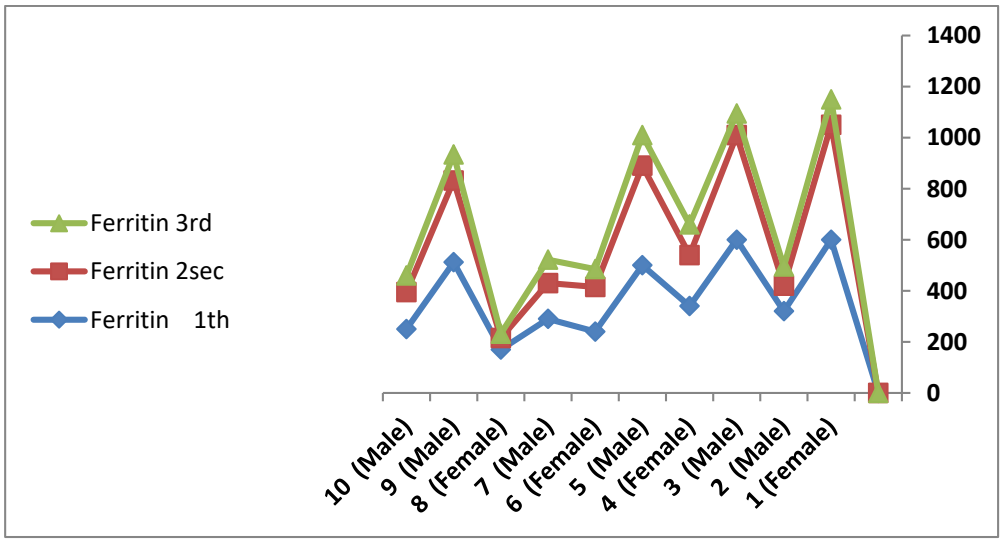

Fig.(1): show the ferritin conc. from 3 weak in different patients.

Pneumonia caused by the novel coronavirus (COVID-19) is a health emergency due to its high infection rate [1] and severe mortality in critically ill patients. The pathological

and physiological processes and diagnostic methods for COVID-19 are still in the exploratory phase. Clinical monitoring and appropriate treatment strategies were essential to improve case fatality. CT scans played an important role in assessing disease [2]. Other sensitive indicators capable of reversing changes in lung lesion and disease severity had to be explored. C-reactive protein (CRP) levels can be used in the early diagnosis of pneumonia [3], and patients with severe pneumonia have high levels of C-reactive protein. We evaluated the relationship between C-reactive protein levels, lung lesions and disease severity to provide a reference for clinical treatment.

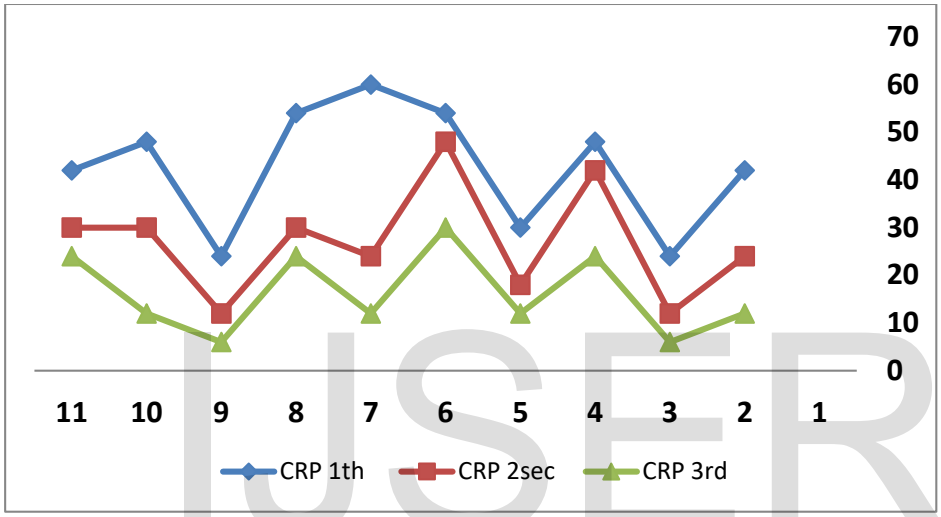

Fig.(2): show the CRP conc. from 3 weak in different patients.

D-dimer are one of the fragments produced when plasmin cleaves in-brin to break up clots. The tests are routinely used as part of a diagnostic algorithm to rule out a diagnosis of a blood clot. However, any pathological or unsatisfactory process that increases fibrin production or breakdown also increases plasma D-dimer levels [13]. Examples include deep vein thrombosis / pulmonary embolism, arterial thrombosis, and metastatic. We can achieve that covid 19 have body increase product as CRP, D-dimer and ferritin, with medicine protocol the body product from them can be control as shown in table (1).

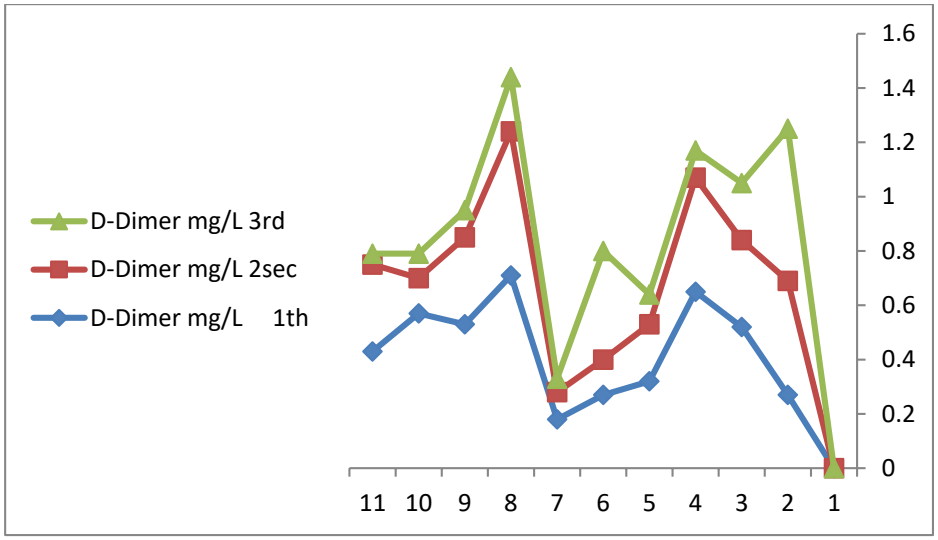

Fig.(3): show the D-dimer conc. from 3 weak in different patients.

Intravascular thrombosis, conditions such as pregnancy, infections, cancer, chronic liver disease, post-traumatic stress and surgery, and vasculitis. Among adults admitted to the emergency room, infection, instead of VTE / PE, is the most common cause of D-dimer elevation [14].

Conclusions

At the early stage of COVID-19, CRP levels were positively correlated with lung lesions. CRP levels could reflect disease severity and should be used as a key indicator for disease monitoring.

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