

Prognostic values of monitoring changes in coagulative, inflammatory & chemical markers in ICU COVID¹⁹ patients

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Conclusion:

This study identifies key biomarkers that predict Covid¹⁹ outcomes, emphasizing the association between platelet count and the final fate of Covid¹⁹ patients admitted to the ICU. **Elevated ferritin levels predict disease deterioration and poor prognosis, whereas lower glucose levels indicate a better prognosis**

Introduction:

The infection caused by the Covid¹⁹ virus is associated with thromboembolic events and severe inflammatory reactions, significantly impacting the prognosis of infected patients. Numerous studies have indicated that Covid¹⁹ patients often exhibit a hypercoagulable state, disseminated intravascular coagulation, and overwhelming inflammation, particularly in critically ill patients with multiple comorbidities requiring admission to the ICU. This study aims to assess the prognostic significance of alterations in coagulation, inflammatory, and blood chemistry markers in Covid¹⁹ patients both before and during admission to the ICU.

Materials and methods:

A descriptive observational retrospective cohort study was conducted at Sheikh Khalifa Medical City in Ajman, United Arab Emirates, from March 2020 to July 2021, involving 90 Covid¹⁹ infected patients admitted to the ICU due to severe illness. The patients were divided into two equal groups: **Group 1 comprised 42 patients who survived and were discharged from the ICU in good condition, while Group 2 included 48 patients who did not improve and succumbed to complications of severe Covid¹⁹ infection.** Patient demographics, comorbidities, and laboratory results (including D-dimer, lactate dehydrogenase, procalcitonin, prothrombin time, platelet count, ferritin, C-reactive protein, glucose, and creatinine) were collected upon admission, after initiating treatment, and at discharge, and their prognostic values were assessed. Inclusion criteria for patient selection included adult Covid¹⁹ patients requiring ICU admission, while exclusion criteria encompassed children, Covid¹⁹ infected patients not requiring ICU admission, and ICU patients not infected with the Covid¹⁹ virus.

Results:

study revealed that **platelet counts significantly increased in survivors** compared to non-survivors from admission to the time of death or discharge. **Procalcitonin and serum ferritin levels rose in non-survivors, whereas they decreased in survivors. C-reactive protein levels decreased in both groups.** Additionally, survivors exhibited a decrease in glucose levels, whereas non-survivors experienced an increase in glucose levels.

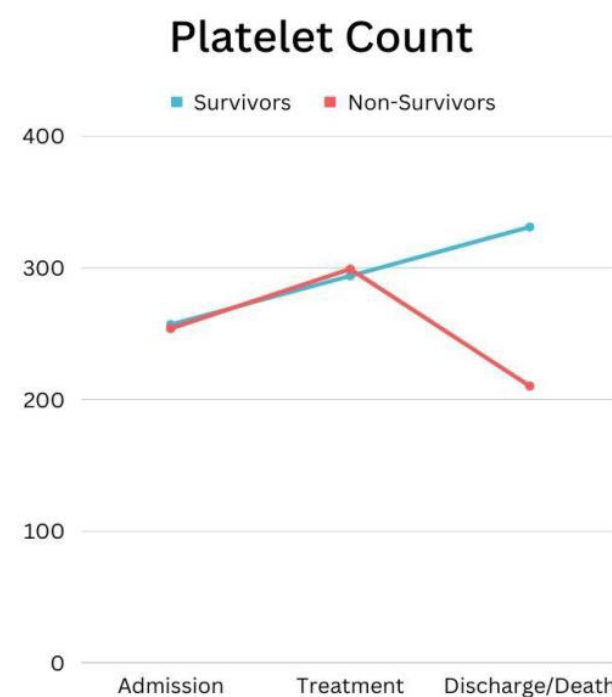


Figure 1: Platelet count in survivors and non-survivors at three moments in time. The graph shows a significant decrease in platelet count for the non-survivors from the beginning of treatment to the time of death.

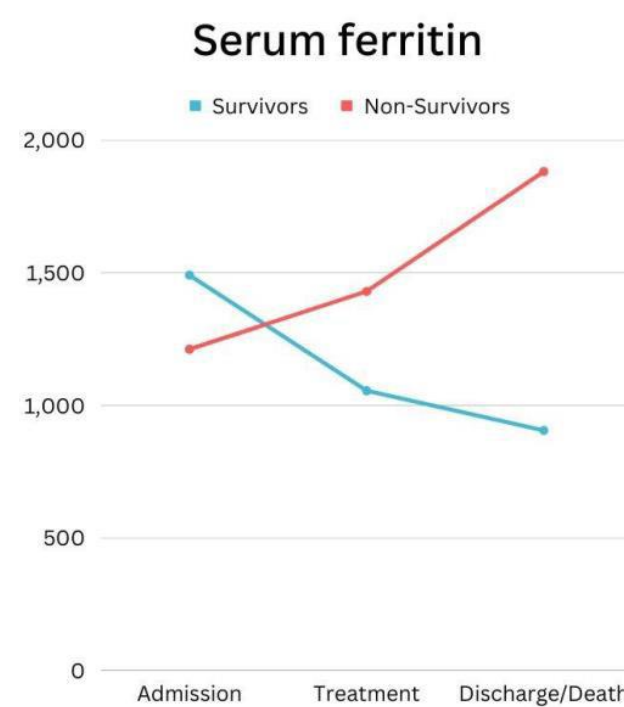


Figure 2: Serum ferritin levels in survivors and non-survivors at three moments in time. The graph shows an overall increase of serum ferritin levels in the non-survivors, compared to an overall decrease in the survivors.

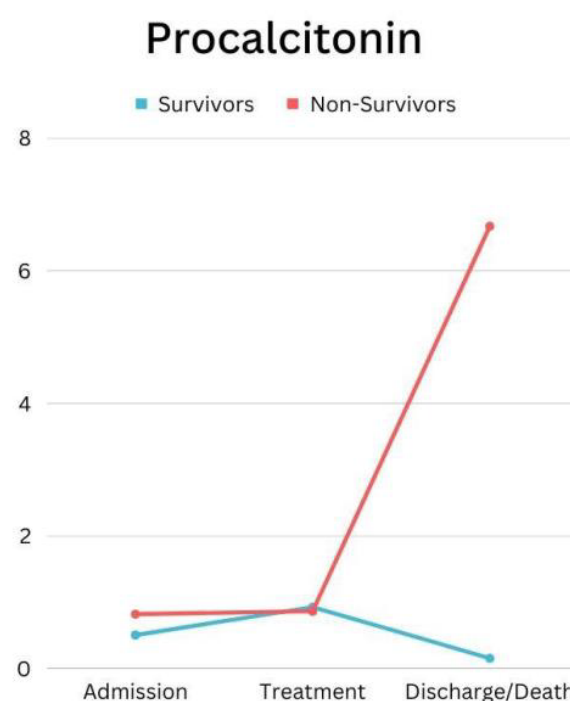


Figure 3: Procalcitonin levels in survivors and non-survivors at three moments in time. The graph shows a significant increase in procalcitonin levels for the non-survivors from the beginning of treatment to the time of death.

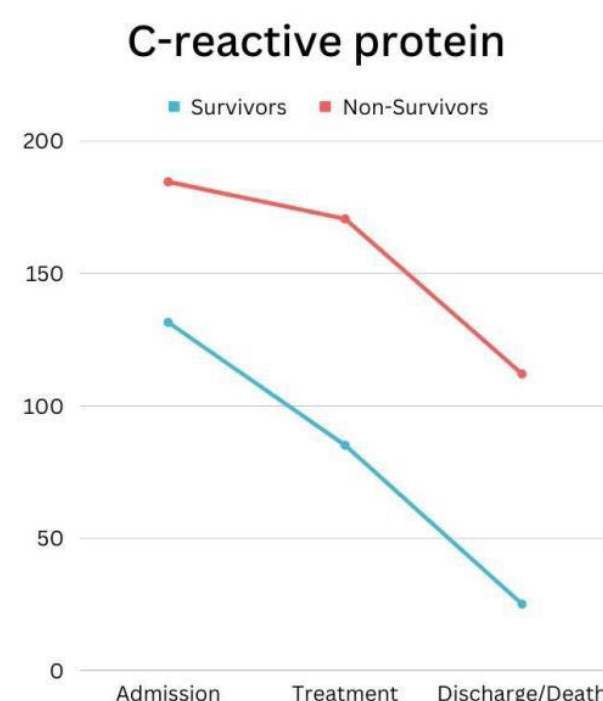


Figure 4: C-reactive protein levels in survivors and non-survivors at three moments in time. Both levels decreased, but a more significant decrease was noticed in the survivors.

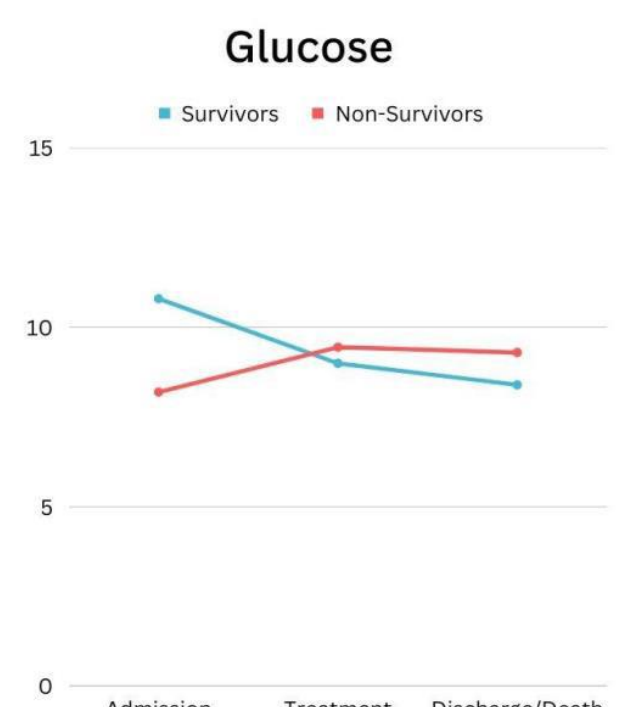


Figure 5: Glucose levels in survivors and non-survivors at three moments in time. A decrease in glucose levels was noticed in the survivors. Meanwhile the non-survivors had an increase in their glucose levels.