Clinical, laboratory and radiological features predictive of survival outcome in severe COVID-19 in Wuhan, China

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Abstract

Objectives: We determined the clinical and imaging features of patients with severe COVID-19 that were associated with survival. Methods: Sixty-seven patients hospitalised with severe laboratory-confirmed COVID-19, were consecutively enrolled. Clinical data, blood measurements and chest computed tomographic (CT) scans were analyzed. Results: We compared the findings between 39 survivors and 28 non-survivors. At admission, although there were no differences in white blood cell (WBC) and platelet (PLT) counts, there was an increase of WBC, neutrophil, platelet distribution width and mean platelet volume with a marked decrease of lymphocyte, monocyte, eosinophil and PLT in non-survivor group on their last day compared to survivors (P < 0.05). Non-survivors had higher ratios of peak creatinine(P<0.05) and peak lactate dehydrogenase (LDH) (P<0.05). Compared to survivors, the incremental rate of total lesion area, ground-glass opacity (GGO) area and consolidation area on CT scans was increased in non-survivors (P<0.05).The deceleration rate of total lung volume was greater in non-survivors than survivors(P<0.05). Using the univariate survival analysis, the following were predictive of non-survival: time from admission to peak of D-dimer (D2D)<16 days , initial pro-BNP>319.0 pg/ml, peak procalcitonin (PCT) [?]0.19 ng/ml, peak creatinine>96.5 μmol/l ,peak alkaline phosphatase (ALP)>81.5 u/l, median time from admission to peak ALP<18 days, the acceleration rate of total lesional area> -11.5 cm3 /day, incremental rate of GGO area> 2.4 cm3 /day and the acceleration of consolidation area> 2.3 cm3 /day. Conclusion: Hematological counts, serum analytes and radiological indicators, the latter assessed by artificial intelligence, are robust predictors of survival outcome in COVID-19.

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