Prognostic significance of N-Terminal Pro-BNP in patients with COVID-19 pneumonia without previous history of heart failure

M. Selcuk1, M. Keskin1, T. Cinar1, N. Gunay2, S. Dogan1, V. Cicek1, S. Kilic1, S. Asal1, S. Yavuz1, N. Keser1, A.L. Orhan1

1 Sultan Abdulhamid Han Training and Research Hospital, Istanbul, Turkey; 2 Ümraniye Training and Research Hospital, Cardiology, Istanbul, Turkey

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Introduction: The objective of the present research was to evaluate the possible association between the N-terminal pro-brain type natriuretic peptide (NT-proBNP) levels and in-hospital mortality in coronavirus disease 2019 (COVID-19) pneumonia patients who did not have pre-existing heart failure (HF).

Methods: A total of 137 consecutive patients without pre-existing HF and hospitalized due to COVID-19 pneumonia were enrolled into the current research. The main outcome of the research was the in-hospital death. The independent parameters linked with the in-hospital death were determined by multivariable analysis.

Results: A total of 26 deaths with an in-hospital mortality rate of 18.9% was noted. Those who died were older with an increased frequency of co-morbidities such as hypertension, chronic kidney disease, coronary artery disease, stroke and dementia. They had also increased white blood cell (WBC) counts and had elevated glucose, creatinine, troponin I, and NT-pro-BNP levels but had decreased levels of hemoglobin. By multivariable analysis; age, NT-pro-BNP, WBC, troponin I, and creatinine levels were independently linked with the in-hospital mortality. After ROC evaluation, the ideal value of the NT-pro-BNP to predict the in-hospital mortality was found as 260 ng/L reflecting a sensitivity of 82% and a specificity of 93% (AUC:0.86; 95% CI: 0.76–0.97).

Conclusion: The current research clearly shows that the NT-proBNP levels are independently linked with the in-hospital mortality rates in subjects with COVID-19 pneumonia and without HF. Thus, we believe that this biomarker can be used as a valuable prognostic parameter in such cases.

Table 1 Univariate analysis and multivariable model for in-hospital mortality

| Parameter                                      | Univariate analysis | Multivariable analysis |
|------------------------------------------------|---------------------|------------------------|
| Age                                            | 0.180               | 0.003                  |
| Male gender                                    | 1.00 (1.00–1.10)    | 0.001                  |
| Hypertension                                   | 0.93 (1.00–1.00)    | 0.001                  |
| Diabetes mellitus                              | 0.85 (0.70–1.04)    | 0.001                  |
| Chronic lung disease                           | 0.85 (0.71–0.99)    | 0.001                  |
| Chronic kidney disease                         | 0.85 (0.72–0.99)    | 0.001                  |
| Coronary artery disease                        | 0.85 (0.72–0.99)    | 0.001                  |
| Smoking                                        | 0.84 (0.70–1.00)    | 0.001                  |
| NT-proBNP (per 100 ng/L)                       | 1.04 (1.00–1.08)    | 0.001                  |
| Troponin I (per 100 ng/L)                      | 1.04 (1.00–1.08)    | 0.001                  |
| C-reactive protein                             | 0.84 (0.70–1.00)    | 0.001                  |
| White blood cell                               | 0.84 (0.70–1.00)    | 0.001                  |
| Hemoglobin                                     | 0.84 (0.70–1.00)    | 0.001                  |
| Platelet                                       | 0.84 (0.70–1.00)    | 0.001                  |
| Creatinine                                     | 0.84 (0.70–1.00)    | 0.001                  |

Figure 1

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