LETTER TO THE EDITOR EDİTÖRE MEKTUP

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Evaluation of Dornase-Alpha Use for Treatment of the Severe COVID-19

Şiddetli COVID-19 Tedavisi İçin Dornaz-Alfa Kullanımının Değerlendirilmesi

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EVALUATION OF DORNASE-ALPHA USE FOR TREATMENT OF THE SEVERE CORONAVIRUS DISEASE-2019

Coronavirus disease-2019 (COVID-19) mostly presents as self-limiting inflammation of the upper respiratory tract. Severe pneumonia develops in 15-20% of patients.[1] Severe COVID-19 pneumonia is an inflammatory disease characterized by alveolar and deep airway destruction.[2] Neutrophils are activated during the inflammatory response to the virus. Then, non-neutrophil trap (NET) production is initiated by reactive oxygen species-dependent activation of neutrophils. Since NETs cause thrombosis and inflammation, it has been thought that drugs with anti-NET effects may have a beneficial role in the treatment of severe COVID-19. Dornase alfa (human DNAse I recombinant form) has an immunomodulatory effect that reduces tissue damage caused by NETs.[1]

There are no large-scale randomized studies on the use of dornase alfa in COVID-19. It has been reported in case reports that dornase alfa has a healing effect.[3,4]

In the four cases (a woman-51 aged, three men 45, 49, 61 aged) reported in this study, C-reactive protein, interleukin-6, procalcitonin ve ferritin seviyeleri yüksek bulunmuştur. All patients had respiratory failure and widespread opacities on thorax computed tomography. Acute respiratory distress syndrome (ARDS) developed, microbiological growth was detected in urine and blood cultures, and sepsis developed in all patients despite antimicrobial treatment. 2.5 mg dornase alpha was administered by inhalation twice a day for five days. It was not found useful in patients who did not benefit from pulse steroid (250 mg/day pulse methylprednisolone treatment, intravenously, for three days) and anticytokine therapy in addition to standard treatment (Favipravir 2*600 mg/10 days orally, enoxaparain 4,000 U/day subcutaneously) and whose clinical condition rapidly deteriorated. Complete recovery could not be achieved in the lung tissues, which were almost completely damaged by inhaled dornase alfa application. Only in the fourth case, minimal improvement in the lung parenchymal tissue was detected in the chest X-

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rays taken on consecutive days. The patient died due to pneumothorax or sepsis complications. There were no adverse effects detected after administering dornase alfa.

No improvement was achieved with inhaled dornase alfa application in ARDS developing in severe COVID-19 pneumonia. It is aimed to contribute to the limited literature data, with the expectation that it may shed light on new studies.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Havva Kubat, Elif Karabacak, Özlem Erçen Diken;* ***Design:*** *Havva Kubat, Elif Karabacak, Özlem Erçen Diken;* ***Control/Supervision:*** *Havva Kubat;* ***Data Collection and/or Processing:*** *Havva Kubat, Elif Karabacak, Özlem Erçen Diken;* ***Analysis and/or Interpretation:*** *Havva Kubat, Elif Karabacak, Özlem Erçen Diken;* ***Literature Review:*** *Havva Kubat;* ***Writing the Article:*** *Havva Kubat, Elif Karabacak;* ***Critical Review:*** *Havva Kubat, Elif Karabacak, Özlem Erçen Diken;* ***References and Fundings:*** *Havva Kubat, Elif Karabacak, Özlem Erçen Diken;* ***Materials:*** *Havva Kubat.*

REFERENCES

1. Szturmowicz M, Demkow U. Neutrophil extracellular traps (NETs) in severe SARS-CoV-2 lung disease. Int J Mol Sci. 2021;22(16):8854. PMID: 34445556; PMCID: PMC8396177.
2. Xu Z, Shi L, Wang Y, Zhang J, Huang L, Zhang C, Liu S, et al. Pathological findings of COVID-19 associated with acute respiratory distress syndrome. Lancet Respir Med. 2020;8(4):420-2. Erratum in: Lancet Respir Med. 2020;8(4):e26. PMID: 32085846; PMCID: PMC7164771.
3. Okur HK, Yalcin K, Tastan C, Demir S, Yurtsever B, Karakus GS, et al. Preliminary report of in vitro and in vivo effectiveness of dornase alfa on SARS-CoV-2 infection. New Microbes New Infect. 2020;37:100756. PMID: 32922804; PMCID: PMC7476504.
4. Weber AG, Chau AS, Egeblad M, Barnes BJ, Janowitz T. Nebulized in-line endotracheal dornase alfa and albuterol administered to mechanically ventilated COVID-19 patients: a case series. Mol Med. 2020;26(1):91. PMID: 32993479; PMCID: PMC7522910.