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Blood Perfusion with Polymyxin B Immobilized Columns in Patients with COVID-19 Requiring Oxygen Therapy: A Multicenter Prospective Cohort Study

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Case Study : Extracorporeal blood purification with polymyxin B immobilized fiber column direct hemoperfusion (PMX-DHP), is reported to be effective in treating COVID-19 pneumonitis with oxygen demand. We previously reported our experience with PMX-DHP in 12 patients early in the COVID-19 epidemic. This multicenter prospective study evaluated the efficacy and safety of PMX-DHP in oxygen-requiring patients with COVID-19 admitted between September 28, 2020, and March 31, 2022. The primary endpoint was the percentage of clinical improvement 15 days after treatment. The secondary endpoint was the percentage of worsened disease status. Data from the COVID-19 patient registry were used for the synthetic control group. A total of 21 patients received PMX-DHP therapy in this study. The improvement rate on day 15 did not differ between PMX-treated patients and controls; however, the deterioration rate was 0.38 times lower in the PMX-treated group, and the death rates on day 29 were 0% and 11.1% in the PMX-treated and control groups, respectively. After treatment blood oxygenation improved, urinary β2-microglobulin and liver-type fatty acid-binding protein showed significant decreases, and IL-6 decreased once during treatment but did not persist. Electron microscopy of the used columns revealed numerous white blood cells, platelets, and fibrin adhered to the fibers. In this study, PMX treatment effectively prevented the worsening of COVID-19 pathology, accompanied by improved oxygenation. PMX treatment to remove activated cells may effectively improve patient outcomes.