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Opinion

Roles of Corticosteroids in the Treatment of Severe Adult Community-Acquired Pneumonia

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Severe community-Acquired pneumonia (CAP), the sixth most prevalent cause of overall mortality and the first infectious cause of death in the developed world. Approximately, 20% to 50% of mortality has been reported, thus leading to high social and economic costs. At least 20% of CAP patients require hospital admission and the mortality is around 10% to 25% of these patients, especially in those requiring intensive care (ICU) admission. Previous studies revealed that the levels of pro-inflammatory cytokines, such as interleukin (IL)-6, IL-8, IL-10, IL-1β, tumor necrosis factor-α, interferon-γ were significantly elevated in severe CAP patients and associated with the severities and outcomes of CAP. An excessive systemic and pulmonary inflammatory response in severe CAP patients may lead to injuries to lung and other organs, adult respiratory distress syndrome, and sepsis despite appropriately producing cytokines in location play a significant role in elimination of primary infection. Decreasing systemic inflammatory response may improve the clinical outcomes of severe CAP. Despite more accurate diagnosis, effective antimicrobial treatment and supportive care advancement, CAP mortality rates remain similar to those demonstrated more than 70 years ago in the antibiotic era.

Currently, corticosteroids are the most potent anti-inflammatory drugs that inhibit expression of pro-inflammatory cytokines and accelerate expression of anti-inflammatory cytokines. A recent study demonstrated that the drug type modified the effect of steroids for mortality rates: methylprednisolone or prednisolone therapy (odd ratio (OR) 0.37, 95% confidential interval (CI) 0.19 - 0.72) decreased total mortality, while hydrocortisone therapy did not (OR 0.90, 95% CI 0.54 - 1.49). The corticosteroid group revealed significant shorter length of ICU stay compared to control group (MD -2.52 days, 95% CI -4.88 to -0.15; $p = 0.04$). A reduction trend in the need for mechanical ventilation in corticosteroid group (OR 0.53, 95% CI 0.28 - 1.02; $p = 0.06$) was observed. No trend towards more adverse events in the corticosteroid group compared to the control group was identified (OR 0.92, 95% CI 0.58 - 1.47; $p = 0.74$). Prolonged use of corticosteroids (> 5 days) reduced the length of hospital stay in severe CAP patients. Treatment with corticosteroids increased the risks of hyperglycemia and hypernatremia, but the their increased risks had not statistically significant difference. A recent meta-analysis demonstrated that adjunctive corticosteroids statistically reduced the severe CAP mortality. Nevertheless, the British guidelines state that ".....steroid are not recommended in the routine therapy of highly severe CAP", whereas South African guidelines " use of systemic corticosteroids should be considered in severe CAP patients requiring ICU admission ".

In conclusion, the current data indicate that adjunctive corticosteroid therapy reduces morbidity and mortality in severe adult CAP patients. Prolonged use of corticosteroids was safe and more beneficial in severe adult CAP patients, particularly hospitalized severe CAP patients with reduction of the risk of ARDS. Nevertheless, large-scale, randomized, double-blind, placebo-controlled trials are urgently needed for evaluation of the safety and efficacy of adjunctive corticosteroid treatment in severe adult CAP patients.

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