Corticosteroids as adjunctive therapy in tuberculous pneumonia with ARF

The use of corticosteroids to modulate the harmful effects of severe inflammatory responses has not been prospectively investigated in patients with severe tuberculosis (TB)–induced acute respiratory failure (ARF). Nevertheless, some clinicians prescribe corticosteroids when TB lesions are large and progressive.

Methods

In total, 90 patients suffering from ARF due to TB who were managed with invasive mechanical ventilation (Asan Medical Center, Seoul, South Korea) were included in the study. Based on radiographical findings, the patients were divided into two groups: TBP (n=66) and miliary TB (MTB; n=24). Age, sex, risk factors for TB, underlying diseases, previous history of anti-TB treatment, extrapulmonary TB, duration of symptoms before admission, sputum acid-fast bacillus smear and culture data, drug susceptibility testing results, arterial blood gas analysis, in-hospital mortality rate, concomitant acute respiratory distress syndrome, shock, multiple organ failure, etc., were recorded and compared between the two groups. The status of adjunctive corticosteroid use (dosage, duration and interval from start of anti-TB treatment to steroid therapy) was also investigated. A multiple logistic regression model was used to evaluate independent risk factors for the prognosis of TB with ARF, including all significant parameters based on univariate analysis.

Results

The median age of all patients was 61.5 years and the sex ratio 1.5:1.0 (male:female). All patients were HIV negative. The symptom duration before admission was 27±26 days. Diabetes mellitus was the most frequent concomitant disease. Diagnosis was confirmed by sputum AFB smear and/or culture (n=80), bone marrow biopsy (n=7) or transbronchial lung biopsy (n=3). Drug susceptibility data were available for 24 patients; isolates from six subjects showed single-drug resistance, two cases multidrug resistance and Mycobacterium tuberculosis from the other 16 patients showed pansusceptibility. The mean durations of hospitalisation, intensive care unit stay and mechanical ventilation were 38±47, 21±27 and 18±26 days, respectively. The mean interval from hospital admission to commencement of anti-TB treatment was 4.3±6.0 days. Systemic corticosteroids were used in 49% cases. The mean daily dosage of prednisolone was 59±6.7 mg, and the median duration of corticosteroid therapy was 20 (7–120) days. The in-hospital mortality rate was 65.6%. TB was the direct cause of death in 50 cases. There were no significant differences in mortality rates between the patients with TBP and MTB. In the TBP group, advanced age and shock unrelated to sepsis were independently associated with poor outcome in subjects suffering from TBP with ARF.

Editorial comment

In many reports in the literature, MTB was identified as the main cause of ARF in TB patients requiring mechanical ventilation while TBP has rarely been the cause of ARF. The beneficial effects of corticosteroids in the management of TBP with ARF are suggested by some authors. Mycobacterial antigen can induce the release of pyrogens from monocytes, lymphokines from specifically sensitised lymphocytes and cytokines, such as tumour necrosis factor, from macrophages and peripheral blood mononuclear cells, which may be responsible for clinical symptoms and tissue damage. Corticosteroids can inhibit the release and activities of lymphokines and cytokines. The granulomatous host response to TB may paradoxically protect sequestered M. tuberculosis from anti-TB therapy. Adjuvant corticosteroids may be beneficial in permitting anti-TB drugs to penetrate granulomas, by disrupting granuloma formation.