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Nebulized Terbutaline and Ipratropium Bromide Versus Terbutaline Alone in Acute Exacerbation of Chronic Obstructive Pulmonary Disease Requiring Noninvasive Ventilation: A Randomized Double-blind Controlled Trial

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Abstract

Background: Short-acting β_2 -agonists are the mainstay of treatment of patients with acute exacerbation of chronic obstructive pulmonary disease (AECOPD) in the emergency department (ED). It is still unclear whether the addition of short-acting anticholinergics is clinically more effective care compared to treatment with β_2 -agonists alone in patients with hypercapnic AECOPD.

Objective: The objective was to evaluate whether combining ipratropium bromide (IB) to terbutaline reduces hospital and intensive care unit (ICU) admission rates compared to terbutaline alone in AECOPD hypercapnic patients.

Methods: In this double-blind controlled trial, patients who were admitted to the ED for AECOPD requiring noninvasive ventilation (NIV) were randomized to receive either 5 mg of nebulized terbutaline combined to 0.5 mg of IB (terbutaline/IB group, n = 115) or 5 mg of terbutaline sulfate (terbutaline group, n = 117). Nebulization was repeated every 20 minutes for the first hour and every 4 hours within the first day. Primary outcomes were the rate of hospital admission and need for endotracheal intubation within the first 24 hours of the start of the experimental treatment. Secondary outcomes included changes from baseline of dyspnea, physiologic variables, length of hospital stay, ICU admission rate, and 7-day mortality.

Results: The two groups were similar regarding baseline demographic and clinical characteristics. Hospital admission was observed in 70 patients (59.8%) in the terbutaline/IB group and in 75 patients (65.2%) in the terbutaline group (respiratory rate [RR] = 1.09, 95% confidence interval [CI] = 0.93 to 1.27, p = 0.39). ICU admission was required in 37 (32.2%) patients in the terbutaline/IB group and 30 patients (25.6%) in terbutaline group (RR = 1.25, 95% CI = 1.02 to 1.54, p = 0.27). There were no significant differences in dyspnea score, blood gas parameters changes, vital signs improvement, and 7-day death rate between both groups.

Conclusion: In patients admitted to the ED for AECOPD requiring NIV, combination of nebulized IB and terbutaline did not reduce hospital admission and need to ICU care.

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