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Antibiotic use in pediatric intensive care patients with lower respiratory tract infection due to respiratory syncytial virus

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Sir, Respiratory syncytial virus (RSV) is the most important respiratory pathogen in infants. It has been demonstrated that many patients hospitalized with RSV lower respiratory tract infection (RSV-LRTI) receive antibiotics [1]. To investigate antibiotic treatment in patients admitted to our pediatric intensive care unit (PICU) with RSV-LRTI we performed a retrospective observational study. Of the 148 patients who were admitted from 1992 through 2000 with RSV-LRTI 126 (85.1 %) received antibiotics. In 62 patients (49.2 %) antibiotics had been started before admission on our PICU, and in 117 patients (92.9 %) antibiotics were started empirically. Patients who received antibiotics had a higher C-reactive protein (48.2 vs. 5 mg/l, $p < 0.05$) and more frequently needed mechanical ventilation [78.6 % (99/126) vs. 27.3 % (6/22), $p < 0.01$] than those that did not receive antibiotics.

Antibiotics were started on suspicion of a bacterial infection of the respiratory tract in 81 % of the patients (102/126). An endotracheal aspirate was available for culture before antibiotics were started in 48 % of these patients (49/102), and in only 57.1 % of these (28/49) one or more strains of micro-organisms was isolated. *Haemophilus influenzae* was most frequently isolated, followed by *Streptococcus pneumoniae*, *Moraxella catarrhalis*, and *Staphylococcus aureus*. Antibiotics were

started in 19 % of the patients (24/126) because sepsis could not be ruled out. Blood was collected for culture in only 54.1 % of these patients (13/24). A micro-organism was isolated in only a single patient (7.7 %).

The reported incidence of secondary bacterial infection of the respiratory tract in patients with RSV-LRTI is highly variable and depends on the methods used. Based on signs of clinical deterioration during admission Hall et al. [2] found only 1.2 %, while studies using antibody increase in serum or antigen detection in serum or urine find an incidence of up to 44 % [3, 4]. Two randomized controlled studies have evaluated the efficacy of antibiotics in patients with RSV-LRTI and found that antibiotics are not beneficial [5, 6]. However, these studies not only excluded patients requiring mechanical ventilation but also had a number of methodological problems.

In conclusion, we found that the majority of patients admitted to the PICU with RSV-LRTI were treated with antibiotics. The treating physicians considered both the need for mechanical ventilation and an increased C-reactive protein level to be risk factors for secondary bacterial infection. In the majority of the patients antibiotics were started on clinical grounds, in most cases on suspicion of a bacterial respiratory tract infection, but in almost one-fifth of the patients on suspicion of sepsis. However, this overuse of antibiotics was not sufficiently supported by microbiological evidence. Only a randomized placebo-controlled study may answer the question of whether a routine full course of antibiotics is justified in patients admitted to the PICU for severe RSV-LRTI. In addition, prospective studies should aim to identify patients who need antibiotics in order to reduce the overuse of antibiotics in patients with viral bronchiolitis.

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