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Etiological characteristics of lower respiratory tract infection in elderly patients with AECOPD and its relationship with inflammation and immune balance

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Objective: To investigate the etiological characteristics of lower respiratory tract infection in elderly patients with acute exacerbation of COPD (AECOPD) and the relationship between inflammation and immune balance.

Methods: A total of 118 elderly AECOPD patients admitted to our hospital from June 2022 to June 2023 were selected and divided into experimental group (80 cases with lower respiratory tract infection) and control group (38 cases without lower respiratory tract infection) according to whether they had lower respiratory tract infection. The distribution and drug resistance of pathogenic bacteria were analyzed. The differences of inflammatory factors such as procalcitonin (PCT), tumor necrosis factor (TNF-α) and interleukin-6 (IL-6) between the two groups were detected by ELISA, and the proportion of T cell subsets such as CD3+, CD4+, and CD8+ in serum was sorted by flow cytometry. The risk factors affecting lower respiratory tract infection were analyzed by multivariate Logistic regression.

Results: Of 118 AECOPD patients, 80 cases were detected pathogens, a total of 91 strains of pathogens were detected, 83 strains of gram-negative bacteria (91.21%), of which Pseudomonas aeruginosa occupied the first place (25 strains), 7 strains of gram-positive cocci (7.69%), 1 strain of fungi (1.10%). The resistance rate of Pseudomonas aeruginosa and Klebsitis to antibiotics other than piperacillin and quinolones was lower than 30%, the resistance rate of acinetobacter baumannii was generally higher, and the resistance rate of Escherichia coli to β-lactam/enzyme inhibitors and amikacin was lower. Compared with the control group, the serum levels of PCT, TNF-α and IL-6 in experimental groups were higher, while the serum levels of CD3+, CD4+ and CD4+/CD8+ were lower ($P < 0.05$). Logistic regression analysis showed that mechanical ventilation, hospital stay≥14 days, hypoproteinemia, diabetes mellitus and high levels of PCT, TNF-α and IL-6 were risk factors for lower respiratory tract infection, and high levels of CD3+, CD4+ and CD4+/CD8+ were protective factors for lower respiratory tract infection ($P < 0.05$).

Conclusion: The main lower respiratory tract infection in elderly patients with AECOPD is gram-negative bacteria, and the drug resistance situation is serious. Lower respiratory tract infection is related to mechanical ventilation, hospital stay≥14 days, hypoproteinemia, diabetes mellitus and inflammatory immune imbalance.

Keywords: COPD acute exacerbation stage; Lower respiratory tract infection; Etiology; Inflammatory immune balance.

Biography

Hongyu Du is a researcher at Chongqing No.7 People's Hospital, specializing in the study of lower respiratory tract infections in elderly patients. With a focus on improving patient outcomes, Dr. Du's work aims to enhance the understanding and treatment of respiratory conditions in geriatric care.