Serum Metabolite Profiles as Potential Biochemical Markers in Young Patients with Community Acquired Pneumonia

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Background and Aims: Despite various biochemical markers and calculation algorithms of Community-acquired pneumonia (CAP), more specific and practical biochemical markers remain to be found for better diagnosis and prognosis. In this study, we aim to detect the alteration of metabolite profiles, explore the correlation between serum metabolites and inflammatory markers, and seek for potential biomarkers for young patients with CAP.

Methods: Eligible CAP patients admitted to the respiratory medical department for CAP between 18 and 30 years old were enrolled. The untargeted metabolomics profiling was performed on XploreMET platform. Metabolites including alcohols, amino acids, etc. were detected and ratios of biological significance were calculated.

Results: L-Alanine, 2-Hydroxybutyric acid, Methylcysteine, L-Phenylalanine, Aminoadipic acid, L-Tryptophan, Rhamnose, Palmitoleic acid, Decanoylcarnitine, 2-Hydroxy-3-methylbutyric acid and Oxoglutaric acid were found to be significantly altered, mainly enriched in propanoate and tryptophan metabolism, and antibiotic associated pathways. Aminoadipic acid was found to be significantly correlated to CRP levels; 2-Hydroxy-3-methylbutyric acid and Palmitoleic acid to PCT levels. ROC analysis further proved predictive values of metabolites in young CAP.

Conclusions: Serum metabolites and their ratios were dysregulated in young patients with CAP. Altered metabolites were correlated to inflammation severity and were of great diagnostic value for CAP.

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