ECC-BYF combined with electro-acupuncture suppress inflammatory response in COPD rats via activating SIRT 1/NF-κB signalling

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Objective: To explore more efficient treatment for chronic obstructive pulmonary disease (COPD), effective-component compatibility of Bufei Yishen formula III (ECC-BYF III) and electro-acupuncture were tested on COPD rats, SIRT1/NF-κB signaling was further investigated to interpret the therapy.

Methods: 70 rats were divided into Control, Model, Aminophylline (APL), ECC-BYF III, Electro-acupuncture (EA), ECC-BYF III+EA, Sham electro-acupuncture (SA) groups randomly. Cigarette smoke exposure combined with repeated bacterial infections was used to establish COPD models in 1-12 weeks. From week 13 to 20, ECC-BYF III group and APL group received corresponding drugs. EA group received electro-acupuncture therapy, which Dazhui (GV 14), Feishu (BL 13) and Shenshu (BL 23) points were selected. ECC-BYF III+EA group received ECC-BYF III intragastrically combined with electro-acupuncture. SA group received simulated electro-acupuncture (non-acupoint). Pulmonary function, pulmonary histopathology, the expression of SIRT1/NF-κB signaling and inflammation related mRNA and protein were detected. **Results:** Significant deterioration was detected in pulmonary function and pulmonary histopathology in COPD rats ($P<0.01$), and inflammatory state was illustrated by increased levels of IL-6, TNF-α and decreased levels of IL-10 ($P<0.01$). After the intervention of APL, ECC-BYF III, EA and ECC-BYF III+EA, both pulmonary function and pulmonary histopathology were improved ($P<0.05$, $P<0.01$), while the levels of IL-6, TNF-α were decreased and IL-10 was increased ($P<0.05$, $P<0.01$). Additionally, the mRNA expression of SIRT 1, NF-κB, IL-6 and TNF-α were decreased and IL-10 was increased ($P<0.05$, $P<0.01$); the protein expression of SIRT 1 was up regulated, NF-κBp65 and Ac-NF-κBp65 were down regulated ($P<0.05$, $P<0.01$). The effect of ECC-BYF III+EA was better in improving pulmonary function, alleviating inflammation than the other treatment groups ($P<0.01$, $P<0.05$).

Conclusions: ECC-BYF III, electro-acupuncture as well as their combination can suppress inflammation, among which the combination therapy has been proved to be the most effective treatment, and the mechanism maybe involved in activating SIRT 1/NF-κB signaling.

Speaker Biography

Fan-li Jin is a doctoral candidate of Henan University of Chinese Medicine (Zhengzhou, China) and her tutor is Professor Jian-sheng Li, which mainly engaged in the prevention and treatment of respiratory diseases by Chinese medicine and is the author of more than 300 academic theses.

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Receive Date: August 02, 2022; **Accepted Date:** August 05, 2022; **Published Date:** September 30, 2022