A pharmacological study on Asthma-COPD overlap (ACO) model in mice

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Asthma-COPD overlap (ACO) rapidly deteriorates the respiratory function and is steroid resistant, and its effective treatment has not been established. The effects of dexamethasone (Dex) and roflumilast (Rof) on the asthma model sensitized and challenged by ovalbumin (OVA), and the ACO model exposed to OVA and cigarette smoke (CS) in BALB/c mice were examined.

In the OVA + CS group, the peak expiratory flow, tidal volume, Newtonian resistance (Rn, central airways resistance) and airway reactivity to methacholine were decreased, and the quasi-static compliance and airway neutrophils were increased when compared with the OVA group. Dex inhibited the specific airway resistance, airway reactivity, airway eosinophils and lymphocytes, and goblet cell hyperplasia in the OVA group. In the OVA + CS group, Dex reduced the airway eosinophils and goblet cells but increased the airway neutrophils and did not affect the respiratory function. Rof decreased the Rn in the OVA group, but did not affect other parameters in the OVA and OVA + CS groups.

Based on these results, the therapeutic effect of Dex was lower in the ACO model than in the asthma model, and the effect of Rof was not clear in both the ACO and asthma models.