INFORMED CONSENT FORM

TITLE: the Mechanism of the Downregulation of Dopamine Receptor in Mechanical Ventilation Induced Lung Injury

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Statement

This is a clinical study approved by Xinhua Hospital Ethics Committee Affiliated to Shanghai Jiao Tong University School of Medicine. This form gives you important information about the study with description of research background, process and method, and please take time to review this information carefully.

Taking part in this study is completely voluntary. You do not have to participate if you do not want to, and you will not lose any benefits to which you are otherwise entitled. If you decide to take part in this study, you will be asked to sign this form.

Research background

Mechanical ventilation is a critical intervention for patients with acute respiratory failure. However, lung overdistension induced by mechanical ventilation at high tidal volumes also causes pulmonary endothelial dysfunction. The injurious effect of mechanical stretch on pulmonary endothelium has been implicated in the development of ventilator-induced lung injury (VILI), which is characterized by pulmonary inflammation and particularly increased vascular permeability. In addition, the investigators and others have previously shown that mechanical stretch increases cultured lung endothelial monolayer permeability in vitro and promotes lung vascular permeability in mice Thus, elucidating the mechanisms underlying the mechanical stretch-induced lung endothelial barrier dysfunction may provide a novel clinical therapeutic target against VILI.

Dopamine is a neurotransmitter, which can also be produced outside the central nervous system. Lung alveolar epithelial cells represent an important source of extraneuronal dopamine, which has a significant role in local organ physiology. Dopamine D1 receptor (DRD1) and D2 receptor (DRD2) are present in lung tissues. Activation of D2DR induces NaKATPase gene expression. Moreover, activation of DRD1 results in the trafficking of NaKATPase to the basolateral membrane of type II alveolar epithelial cells, thus increasing lung liquid clearance during acute lung injury. Although the lung-protective effects of DA and its implication in the pathology of ALI are emerging, the mechanisms are still largely unknown.

In the present study, the investigators will analyze the influence of mechanical ventilation on dopamine receptors in the lung tissue, and explore whether DA could protect ventilation induced lung injury, which is helpful for prevention and treatment of ventilation induced lung injury.

Research process and methods

The lung tissues were homogenized, and incubated in cold RIPA lysis buffer (Beyotime, China) containing proteinase Inhibitor Cocktail (Sigma-Aldrich) to isolate the total proteins. The tissue extracts (40-50μg protein) were separated by 10%SDS-PAGE and subsequently transferred onto a PVDF membrane (Millipore Corp, Bedford, MA). After blocking, immunoblots were incubated with primary antibody against DRD1(1:1000; Abcam), DRD2(1:1000; Proteintech), TH (1:1000; Proteintech), DDC (1:1000; Abcam), Ac-a-tubulin (1:1000; Santa Cruz Biotechnology), β-actin(1:1000; Santa Cruz) at 4℃ overnight. The secondary antibodies employed were HRP-conjugated IgG (1:3000; Proteintech) for 1h at room temperature. The antibody-reactive bands were visualized by using the enhanced

chemiluminescence Western blotting detection system(Millipore). Total β-actin protein levels were detected for sample loading correction and normalization. In determination of the expression level of above protein, we had a bulk preparation of normal placental protein which was set as a control.

Research significance

Your generous donation will help researchers to analyze the influence of mechanical ventilation on dopamine receptors in the lung tissue. Furthermore, it will benefit the diagnosis, prevention and treatment of intraoperative and postoperative complications caused by general anesthesia and mechanical ventilation.

Privacy policy

Your privacy will be protected.

Signature

I understand the information printed on this form. My question so far have been answered. I agree to take part in this study.

Signature Date