Dopamine D1 receptor agonist A-68930 inhibits NLRP3 inflammasome activation and protects rats from spinal cord injury-induced acute lung injury

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Study design: Randomized experimental study is performed.

Objectives: The study aimed to investigate the therapeutic efficacy and molecular mechanisms of A-68930 in a rat model of spinal cord injury (SCI)–induced acute lung injury (ALI).

Setting: China is selected as a setting.

Methods: The influences of A-68930 on the pulmonary edema, histological changes, pro-inflammatory cytokines levels, (myeloperoxidase) MPO activity and NLRP3 inflammasome protein expression were estimated.

Results: SCI significantly promoted NLRP3 inflammasome activation, increased proinflammatory cytokines productions and MPO activity, induced pulmonary edema and tissue damage in the SCI group as compared with the control group. A-68930 administration significantly inhibited NLRP3 inflammasome activation, reduced inflammatory cytokines levels and MPO activity. Moreover, A-68930 administration attenuated pulmonary edema and histopathology.

Conclusion: Our experimental findings indicated that A-68930 exhibited protective effect on SCI-induced ALI by the alleviations of inflammatory response with the inhibition NLRP3 inflammasome activation 72h post-injury. The present study indicated that A-68930 could be a potentially efficient therapeutic strategy for the treatment of SCI-induced ALI.

Biography
Liulong Zhu is the President of Hangzhou Orthopaedic Association and Chair of Department of Orthopedics. He graduated from the medical college of Shanghai Jiaotong University and studied with professor Kerong Dai who is the member of Chinese Engineering Academy. He is skillful in the treatment for spinal diseases and acquired second prize of Science and Technology Progress of Shanghai.

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