P2X7R promote the attack of acute gouty arthritis in rats from clinical to pathology

Xiaojian Dai, Li Xiang, Jinhu Tuo, Xuan Fang, Yuan Xia, Li Xiaomei,
1The First Affiliated Hospital of University of Science and Technology of China, Rheumatology and Immunology, Hefei, China; 2The First Affiliated Hospital of University of Science and Technology of China, Rheumatology and Immunology, Hefei, China.

Background: ATP may be the second causative signal for the onset of gout, which acts on P2X7R to regulate the development of acute gouty arthritis and the production of pro-inflammatory cytokines.

Methods: 120 male Sprague-Dawley rats were randomly divided into 3 groups: after establishment of acute gouty arthritis model, rats were given P2X7R agonist ATP, P2X7R inhibitor BBG and PBS, respectively. The clinical manifestations of the ankle joints were evaluated at 6h, 12h, 24h, and 72h after the rats were sacrificed, and rat ankle synovial slices for H&E staining. IL-1β, IL-6 and TNF-α in the serum of rats were detected by ELISA kits.

Results: 1. P2X7R regulates the development of acute gouty arthritis: At 12h, the clinical scores of ATP group were significantly higher than those of BBG group and control group (P<0.001, 0.042), and the control group was higher than BBG group (P=0.034); At 12h and 24h, the swelling index of ATP group was the most obvious than other two groups (P=0.000, 0.001; P=0.000, 0.003), followed by control group (P=0.009, 0.001); Furthermore, there was a large infiltration of inflammatory cells in the synovial tissue of the right ankle joint of rats, at 12h, and 24h, the infiltration of mononuclear cell in ATP group was significantly higher than that in BBG group and control group (P=0.000, 0.0077; P=0.000, 0.0017). The neutrophils infiltration in ATP group was the highest among the three groups at 24h (P=0.000, 0.04), and the control group was higher than BBG group (P=0.004).

2. P2X7R regulates pro-inflammatory cytokines production: At 24h, the level of IL-1β in ATP group was significantly higher than BBG group and control group (P=0.001, 0.003); At 6h, 12h and 24h, higher level of IL-6 in ATP group compared with BBG group and control group (P=0.004, 0.04; P=0.000, 0.002; P=0.001, 0.012); The level of TNF-α was obviously higher in ATP group than in BBG group and control group at 6h and 24h (P=0.007, 0.011; P=0.001, 0.018), and BBG group was lower than control group, but without statistically significant (P<0.05).

Conclusion: Activation of P2X7R can significantly promote the attack of acute gouty arthritis and the production of IL-1β, IL-6 and TNF-α, suggesting that P2X7R affects the development of acute gouty arthritis and regulates the secretion of pro-inflammatory cytokines.

REFERENCE


Disclosure of Interests: None declared