OP 013

Experimental Study on the Effect of Human Albumin against Paraquat- Induced Acute Lung Injury

Zhang Pengsi

Abstract

Objectives: To observe whether human serum albumin has the protective effect in the Paraquat-induced acute lung injury of SD rats, and if there are differences in different concentrations of albumin. To speculate the possible mechanisms to provide the basis for albumin using in the clinical treatment of paraquat poisoning.

Methods : 216 SD male rats were divided into 6 groups randomly: control group (Ngroup), Paraquat poisoning group(PQ group), human serum albumin control group (HA group), Paraquat poisoning + human serum albumin low dose group (0.25g/Kg) (PQ + LHA group), Paraquat poisoning + human serum albumin moderate doses group (0.5g/Kg) (PQ + MHA Group), Paraquat poisoning + human serum albumin high-dose group (0.75g/Kg) (PQ + HHA group). PQ group and albumin treatment group were administrated by intraperitoneal injection of 20mg/kg PQ in one-time exposure. Albumin treatment group were administrated by tail vein injection of serum albumin after 2 hours . PQ + LHA group :20% human serum albumin 0.125ml/Kg, PQ+MHA group : 20% human serum albumin 0. 25ml/Kg, PQ +HHA group : 20% human serum albumin 0. 375ml/Kg , once every 24 hours. PQ group saline intravenously every 24 hours. Respectively, after intraperitoneal injection of 1 day, 3 days, 5 days, 6 rats were executed in each group at random. We observed weight 、symptoms、pathological changes in the lung tissue and immunohistochemical expression of SOD、MDA 、NF-κBP65、Bax、Bcl-2 in lung tissue.

Results:

1. Change of animals weight: the control group animal weight continued to increase while PQ poisoning group animal weight continued to decline, it has a statistical significance compared with the control group($P<0.01$) . Human Albumin treatment group weight changed similarly to that of PQ poisoning group, but the weight of all different stages were higher than those of PQ poisoning group, and there was significant difference in the fifth day ($P<0.05$).

2. The content of SOD in lung tissue: The content of SOD in PQ group was gradually down trend in 1, 3, 5d and obviously lower than those of the control group. The difference was all significant statistically (P<0.05); The content of SOD in HA group were higher than the PQ group in 3d, 5d, and the difference was significant (P<0.05). At the same time , the content of SOD in PQ + HHA group and PQ + MHA group were higher than PQ + LHA group, and there is a significant differernce(P<0.05).

3. The content of MDA in lung tissue: The content of MDA in PQ group was gradually increasing in 1d, 3d, 5d and was obviously higher than those of the control group. The difference was all significant statistically (P<0.05). The content of MDA in HA group are lower than the PQ group in 1,3, 5d , and the difference was statistically (P<0.05), At the same time, the content of MDA in PQ + HHA group were lower than PQ + LHA group and PQ + MHA group, the difference was statistically (P<0.01).

4. The pathological changes of the lung tissue under the light microscope(HE): N group : alveolar structure was clear, no inflammatory cell infiltration .The pathological changes of PQ group (1d、3d、5d)was acute diffused lung injury which manifested as hemorrhage, effusion and infiltration of inflammatory cell of internal alveolar space. The pathological changes of human serum albumin-treated rats (1,3,5 days) a small amount of visible focal alveolar inflammatory cell infiltration, compared with normal lung tissue structure.

5. The content of NF-κBP65 in lung tissue: The content of NF-κBp65 in PQ group reached a peak in the third day .The difference was significant (P<0.01). The content of NF-κBP65 in HA group were lower than the PQ group in 1d, 3d, and the difference was significant statistically (P<0.05).

6. The content of Bcl-2 in lung tissue: Bcl-2 in PQ group reached a peak in the first day,and the difference was significant (P<0.01). Bcl-2 in HA group were higher than the PQ group in 1d, 3d, there is a significant difference (P<0.05).

7. The content of Bax in lung tissue: Bax in PQ group reached a peak in the first, and the difference was significant (P<0.01). Bax in HA group were lower than the PQ group in 1,3, 5d, and the difference was significant (P<0.05).

Conclusions:

1. Human serum albuminhas a protective effect to acute lung injury of rats which were caused by PQ poisoning.

2. Human serum albuminhas can obviously restrain the high expression of MDA in the lung tissue by PQ poisoning. And human serum albuminhas can restrain lipid peroxidation, balance the oxidation state. And the effect may be the important mechanism in reduce acute lung injury by PQ poisoning.

3. Human serum albumin can decrease the expression of NF-κBP65 and Bax in the lung tissue of Paraquat poisoning, and increased expression of Bcl-2.The study proved that human serum albumin can inhibit lung cell apoptosis by inflammatory cytokines.