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The changes of Endoplasmic reticulum stress related protein in paraquat-induced acute lung injury rat

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Abstract

Objective: To explore the change of Endoplasmic reticulum stress (ERS) related protein in paraquat-induced acute lung injury rats.

Methods: Eighty male SD rats were randomly divided into control group(n=40) and paraquat (PQ) poisoning group(n=40)at the animal experiment 's center of the Shengjing hospital affiliated to China Medical University. The acute lung injury rats model was established by intraperitoneal injection of paraquat .Control group (A、B、C、D,n=10,respectively) and PQ group (E、F、G、H,n=10,respectively)were executed at different time points:12hours、1day、3days、5days after poisoning.The pathological changes were observed by HemateinEosin(HE) and the level of glucose -regulated protein 78(GRP78) and CCAAT/enchancer-binding protein-homologous protein (CHOP) protein were detected by Westernblot and Immunohistochemistry. Data were expressed as mean±standard error of the mean (□X±s). Statistical 'analysis was carried out with the soft SPSS 17.0. Differences within the groups were analysed by one-way analysis of variance and LSD-t test.

Results: (1)The pathological examination showed the damage of lung tissue structure,alveolar interval fractures, intensive inflammatory cell infiltration in paraquat poisoning rats. The lung tissue damage increase gradually with the extension of time. (2)The relative intensity of GRP78/GAPDH of control groups were respectively 0.78±0.0339(A)、0.76±0.0491(B)、0.771±0.0533(C)、0.775±0.0313(D),and PQ groups respectively 1.361±0.2466(E)、0.936±0.138(F)、 0.85±0.0889(G)、0.528±0.1123(H).Compared to A group,there were significant decreases in E group（t=7.92，P<0.05）.There was significant difference between F group and B group（t=2.4，P<0.05）. There were no significant difference between A group 、B group、Cgroup、Dgroup. The relative intensity of CHOP/GAPDH of control groups were respectively 0.6±0.1153(A)、0.61±0.073(B)、0.65±0.019(C)、0.63±0.0993(D)）, and PQ

groups respectively 2.335±0.0933 (E)、1.824±0.1121 (F)、1.158±0.0421 (G)、0.632±0.0883 (H). The level of CHOP protein were significantly increased in E group compared with A group （t=31.76, P<0.05）. Compared to B group,there were significant decreases in F group（t=22.23, P<0.05）. There was significant difference between G group and C group（t=9.3, P<0.05）.(3)The expression of pulmonary GRP78 and CHOP proteins were up-regulated in PQ groups and E group was the highest group among eight groups.The GRP78 protein mainly localized in endochylema of bronchial epithelial cells、alveolar epithelial cells and a small amount of pulmonary vascular endothelial cells. The CHOP protein mainly localized in karyon of bronchial epithelial cells、alveolar epithelial cells and a small amount of pulmonary vascular endothelial cells.

Conclusions: Endoplasmic reticulum stress participates in the process of paraquat-induced acute lung injury in rats.