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THE EXPERIMENTAL STUDY OF PROTECTIVE EFFECTS OF ATRIAL NATRIURETIC PEPTIDE (ANP) INJECTION ON THE CULTURED HUMAN UMBILICAL VEIN ENDOTHELIAL CELLS INJURED BY HYPOXIA-REOXYGENATION

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Objective To study the protective effects of Atrial Natriuretic Peptide (ANP) Injection on the cultured human umbilical vein endothelial cells injured by hypoxia-reoxygenation.

Methods Hypoxia-reoxygenation group (n=6): cells were cultured in the hypoxia box for 6 h, then reoxygenation for 6 h; 3. hypoxia-reoxygenation+different concentrations of ANP Group: 0.001 μg/ml (n=6); 0.005 μg/ml (n=6); 0.01 μg/ml (n=6); 0.05 μg/ml (n=6); 0.1 μg/ml (n=6), and also hypoxia cultured for 1 h and reoxygenation 6 h; the cells in the cell morphology were observed under inverted microscope, cell culture supernatant obtained in each group were measured {malondialdehyde (MDA), lactate dehydrogenase (LDH), nitric oxide (NO) and endothelin (ET) content, the final results of statistical analysis conducted.

Results The dehydrogenase (LDH) activity in hypoxia-reoxygenation group was significantly higher compared with the control group (69.35±5.66 vs 31.04±3.43, p<0.01); LDH activity in drug intervention group was significantly decreased compared with hypoxic reoxygenation (p<0.01). MDA content in hypoxia-reoxygenation group was significantly higher

than that in the control group (5.94±0.58 vs 1.69±0.16, p<0.01), but MDA content in drug intervention group was significantly lower than that in hypoxia-reoxygenation group (p<0.01), during the range of ANP concentration from 0.001 μg/ml to 0.05 μg/ml), MDA content in the culture medium concentration showed negative correlation with ANP concentration in the ANP group (p<0.01). Levels of intracellular SOD in hypoxia-reoxygenation group were significantly lower than that in the control group (15.74±2.17 vs 47.08±4.23, p<0.01) and was significantly higher in drug treatment group than in hypoxia-reoxygenation group (p<0.01), When ANP concentration range from 0.001 μg/ml to 0.05 μg/ml, each sub-group correlation analysis showed medium concentration of SOD content was positively correlated with ANP concentration in ANP intervention group (p<0.01); Nitric oxide (NO) levels in cell culture medium in hypoxia group was significantly lower than that in the control group (36.81±3.78 vs 89.78±7.01, p<0.01), ET-1 content was significantly higher than that in the control group (1368.64±99.07 vs 305.52±35.30 p<0.01); Correlation analysis showed that: ANP concentration ranged from 0.001 μg/ml to 0.05 μg/ml, in each sub-group of ANP intervention group, NO levels were positively correlated with ANP (p<0.01), while the concentration of ET-1 concentration was negatively correlated with ANP concentration (p<0.01).

Conclusion ANP could reduce the concentration of LDH and MDA content in the culture medium and increased human umbilical vein endothelial cell SOD content; ANP improved the content of NO and reduced the content of ET-1 after human umbilical vein endothelial cells undergoing hypoxia-reoxygenation injury, thus playing an important role in protecting the endothelial function.