Objectives To investigate the effect of Olmesartan on the levels of PRA and Ang II in plasma and the protein levels of α_{1A}, β_1 andβ_2 adrenergic receptor in lungs from rats with chronic heart failure (CHF) induced by myocardial infarction.

Methods Models of CHF established by anterior descending coronary artery ligature. Fifty four Wistar rats were randomly divided into four groups: control group (group A), sham operation group (group B), CHF model group (group C), Olmesartan group (group G).Heart function was determined by echocardiography. Plasma PRA and Ang II levels were measured by radioimmunoassay. The protein expression levels of α_{1A}-AR, β_1-AR and β_2-AR in lungs were measured by Western blot.

Results

(1) Changes of LVEF: Before therapy, there was no significant difference between group A and B ($p>0.05$). Compared with group B, the left ventricle ejection faction (LVEF) of group C and group G were significantly decreased ($p<0.01$, $p<0.05$). After therapy, compared with group C, LVEF of group G was significantly improved ($p<0.05$).

(2) Changes of PRA and Ang II: After therapy, there was no significant difference between group A and B ($p>0.05$). Compared with group B, the lever of PRA and AngII of group C were significantly increased ($p<0.01$). After therapy, compared with group C, the lever of PRA and AngII of group G were significantly decreased ($p<0.05$).

(3) Changes of protein expression: After therapy, no significant changes were seen in protein expression of α_{1A}-AR, β_1-AR and β_2-AR in group A and B ($p>0.05$). Compared with group B, α_{1A}-AR, β_1-AR protein expression decreased in group C ($p<0.05$), but expression of β_2-AR markedly increase in group C ($p<0.01$). Compared with group C, protein levels of α_{1A}-AR, β_1-AR and β_2-AR significantly increased in group G ($p<0.01$).

Conclusions LVEF is increased and heart function is improved when Olmesartan is used to treat rats with CHF induced by myocardial infarction. After taking Olmesartan, Plasma PRA and Ang II levels were significantly decreased and the protein expression of α_{1A} -AR andβ_1 –AR in lungs are regulated towards normal, but the expression of β_2-AR is still up-regulated. The changes of adrenergic receptor expression level are conducive to the maintenance of lung ventilation/perfusion ratio, which can relieve the congestion of pulmonary circulation and reduce pulmonary oedema. Thus Olmesartan plays a beneficial therapeutic effect on rats lung with CHF.

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EFFECTS OF OLMESARTAN THERAPY ON THE EXPRESSION OF ADRENERGIC RECEPTORS IN RATS LUNG WITH CHRONIC HEART FAILURE

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