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EFFECT OF β_3 -AR ON THE SCAVENGER RECEPTOR CLASS B TYPE 1 (SR-B1) AND ITS SIGNAL TRANSDUCTION MECHANISM IN MICE WITH APOLIPOPROTEIN E GENE KNOCKOUT

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Guo yanqing, Li yanfang, Wang zhaohong, Li yanfang. *Anzhen Hospital***Objectives** To investigate the effects of β_3 -AR on the lipids, atherosclerosis plaques, scavenger receptor class B type 1 (SR-B1) and its signal transduction in mice with apolipoprotein E gene knockout.**Methods** Ten C57BL/6J mice (10 weeks) were selected as control group, and 50 Apo E^{-/-} mice (10weeks) were randomly divided into five groups: high-fat model group, positive medicine group, small dose β_3 -AR agonist group, large dose β_3 -AR agonist group, β_3 -AR antagonist group. Since 36 weeks, β_3 -AR agonists or β_3 -AR

antagonists were given for 12 weeks. Total cholesterol (TC), triglyceride (TG) and high density lipoprotein cholesterol (HDL-C) were examined by automatic biochemical analyser. Thoracic aortas were taken for pathology. SR-B1, P-MeK1/2 and P-Erk1/2 were detected by western blot. Activities of protein kinase C (PKC) were measured by non-radioimmunoassay.

Results The serum levels of TC, TG and HDL-C were (2.58 ± 0.35) mmol/l, (0.67 ± 0.039) mmol / L and (1.87 ± 0.11) mmol / L in control group, while (22.20 ± 1.29) mmol / L, (3.19 ± 0.049) mmol/l and (2.26 ± 0.274) in high-fat model group, which were significantly higher ($p < 0.01$) compared with the control group. The serum levels of TC, TG and HDL-C were (18.27 ± 1.30) mmol/l, (1.88 ± 0.143) mmol/l and (3.60 ± 0.226) mmol/l in small doses of β_3 -AR agonist group, (17.06 ± 1.52) mmol/l, (1.55 ± 0.062) mmol/l and (4.33 ± 0.257) mmol/l in large dose group. Compared with high-fat model group, the levels of TC, TG were significantly lower ($p < 0.01$), HDL-C levels were significantly higher ($p < 0.01$) in β_3 -AR agonist group, and large dose group was better than the small dose group ($p < 0.05$). Compared with high-fat model group, thoracic aortic atherosclerotic plaque areas decreased ($p < 0.01$), lumen areas decreased ($p < 0.01$), the expression of SR-B1, P-MeK1/2 and P-Erk1/2 increased ($p < 0.01$), activities of liver PKC increased ($p < 0.01$) in β_3 -AR agonist group. Large dose group was better than small dose group ($p < 0.05$).

Conclusions Excited β_3 -AR may decrease the levels of serum TC and TG, increase HDL, reduce the plaque area of thoracic aorta, increase liver SR-B1, P-MeK1/2 and P-Erk1/2, increase liver PKC activity in order to anti-atherosclerosis.