Objective: To explore the effects of irbesartan on activities of Na+-K+-ATPase, Ca2+-ATPase, Angiotensin II (AngII) and vascular remodelling in renal hypertensive rats (RHRs).

Methods: Renovascular hypertension was induced by two kidney-clip method. Eighteen RHRs were randomly divided into 3 groups: RHR model group (n=6), irbesartan treated group [50 mg/kg (d)], withdrawal group (n=6). Six rats were included in sham operation group. Blood pressure was measured before and after using irbesartan. Thickness of vascular wall (TVW) of thoracic aorta and mesenteric artery were also found [thoracic aorta: (11.9±1.9) vs (7.5±1.6) μmol Pi/(h·mg pro); mesenteric artery: (11.6±1.9) vs (8.2±0.8) μmol Pi/(h·mg pro), both p<0.01]. No change of Na+-K+-ATPase activity was found after irbesartan treatment. After one-week discontinuation of treatment, blood pressure was significantly elevated, the activity of Ca2+-ATPase of thoracic aorta [(7.6±1.4) μmol Pi/(h·mg pro)] and mesenteric artery [(6.9±1.3) μmol Pi/(h·mg pro)] was decreased (both p<0.01). There was a significant negative correlation between AngII and the activity of Ca2+-ATPase in RHR.

Conclusions: The vascular remodelling of RHR may be associated with decreased vascular ATPase activities. Irbesartan can reverse vascular remodelling partially by increasing Ca2+-ATPase activity.