The renin angiotensin (AT) system seems to play an important role in the development of cardiac and vascular hypertrophy in hypertension. AT receptor antagonists have increasingly become part of the first line of treatment against hypertensive diseases and losartan was shown to improve cardiovascular morbidity and mortality in patients with isolated systolic hypertension and LV hypertrophy. The changes in pathology, protein and gene expressions of AT II receptor type (AT I A), angiotensin converting enzyme (ACE) were investigated to explore the effects of losartan in spontaneously hypertensive rat (SHR) models.

Methods: Twelve week old male Wistar rats were grouped as follows: control (C) group, hypertension (H) group, and losartan (L) group in which SHR was treated with losartan (10 mg/kg/day). Blood pressure was estimated in weeks 1, 3 and 5. The rats were sacrificed in week 3 and 5. Heart and kidney tissues were removed. Western blot and RT-PCR analysis of AT I A and ACE of the heart tissues were performed. Serum renin, aldosterone, ACE and AT concentrations were estimated.

Results: Systolic blood pressure was significantly decreased in the L group compared with the H group in weeks 3 and 5. In week 3, left heart weight (LHW) was significantly higher in H group compared with C group and significantly lower after losartan treatment. Serum renin level was significantly higher in H group compared with C group in weeks 3 and 5. Serum aldosterone level was significantly higher in H group compared with C group in week 5 and was significantly lower after losartan treatment. Collagen content significantly increased in H group compared with C group. Collagen content was lower in L group, but did not significantly differ to L group. In western blot analysis, ACE and AT I A protein contents were significantly higher in H group compared with C group in week 3. ACE and AT I A protein contents were significantly higher in H group compared with C group in week 5 and were significantly lower in L group.

Conclusions: Losartan reduced blood pressure, cardiac hypertrophy and protein expressions of ACE and AT I A. Changes in protein expressions were more sensitive than changes in pathology. Further study is needed of differing doses of losartan in SHR models.

Materials & Methods

- Estimation of systolic blood pressure
- Measurements of total weight, LV, kidney
- Serum renin, ACE, aldosterone
- Pathologic finding
  - Trichrome staining
  - Electromicroscopic finding
  - Microarray analysis of LV tissue
  - Western blotting
  - RT-PCR confirmation of left ventricle

Systemic blood pressure after losartan treatment

Changes of gene expressions after losartan treatment in SHR models

Conclusions

- Losartan reduced blood pressure, left heart weight and protein expressions of ACE and angiotensin II receptor type 1A.
- Changes in protein expressions were more sensitive than changes in pathology.
- Further study is needed according to different doses of losartan in SHR models.

References


There was no conflict of interest on this poster.