

Long-term effects of dietary protein intake on renin-angiotensin system and sodium balance.

Akira Hishida, Kazuhisa Ohishi, Chi Ji Ming, Yuko Shibuya and Tatsuo Yamamoto

First Department of Medicine, Hamamatsu University School of Medicine

Summary

The effects of high and low protein diet on renin-angiotensin system and sodium balance were studied in 24 male Sprague-Dawley rats. Each rat was fed by 15 g/day of high (40%), normal (23%) or low (6%) protein diet for 12 weeks. High and low protein diets did not affect body weight, blood pressure and urinary excretion of sodium. Urinary excretion of urea nitrogen, kidney weight and 24 hr creatinine clearance were high in high protein diet rats and low in low protein diet animals. Plasma aldosterone concentration was lower in low protein diet when compared with high protein diet, though no significant difference was found in plasma renin activity in three groups. Renal renin content in high protein diet group was significantly lower than low protein diet rats. These results suggest that sodium balance in high protein diet might be maintained with the balance of high glomerular filtration and high tubular reabsorption rate. The high plasma aldosterone level and the low renal renin content might contribute to the sodium balance in high protein diet rat.