71) Effect of Pork and Krill-Proteins on Blood Pressure in Stroke-Prone SHR (SHRSP).

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INTRODUCTION

Hypertension and its related diseases in SHRSP are determined by genetic and environmental factors. Especially dietary condition as one of environmental factors plays an important role in the development of hypertension. In previous reports, we demonstrated that fish protein attenuated the development of severe hypertension and decreased the incidence of stroke in SHRSP. And it was proved that the attenuation in blood pressure was caused by sulfur-containing amino acids, such as taurine and methionine, in fish protein. Although whole krill containing diets blunted the development of hypertension in SHRSP, krill is not yet commonly used as food stuff for men. Since pork is so commonly used source of protein for men, the cardiovascular effect of proteins in krill and pork were presently analyzed in SHRSP in consideration of the utilization of proper protein source for healthier life in mankind.

MATERIALS AND METHODS

Lipid components from krill without crust and from pork were extracted with an acetone, and free amino acids were washed out. Thirty percent of these proteins were mixed with SP diet (Funabashi SP), respectively. Twenty four male SHRSP at the age of 40 days were divided into three groups: KP, PP and SP groups were given krill-protein (KP) rich diet, pork-protein (PP) rich diet and control SP diet, respectively. Body weights and blood pressure by a tail cuff method (UR-1000, UEDA ELECTRONIC WORKS, Tokyo) were measured every other week, and the intake of diet and water were measured in metabolic cages once every month. The constituents of amino acids in krill and pork-protein rich diets were analyzed by an amino acid analyzer (HITACHI 835).

RESULTS

KP and PP, both diets attenuated the development of severe hypertension in comparison with SP, but the blood pressure reduction in KP group was significantly greater than in PP group. No difference in the methionine contents of KP and PP diets was detectable. Though consumptions in KP and PP groups were lower than SP group, the body weights in KP and PP groups were heavier than those in SP group. There was no significant difference in the body weight, 321 ± 6 , 315 ± 6 g and the dietary intake 20.1 ± 0.75 , 19.4 ± 0.3 g/day, respectively at the age of six months between KP and PP group. Water intake in SP group was greater than KP group, and there was no difference between KP and PP groups.

DISCUSSION

In this study, a significant reduction of blood pressure was observed in KP and PP groups compared with SP group. Since the amino acids contents of KP and PP diets (35.6, 35.2) are greater than that of SP diet (18.9 %), this reduction may be caused by the increased, especially methionine which was protein to decrease blood pressure in SHRSP. KP diet attenuated the development of hypertension in SHRSP significantly more effectively than PP diet: 206 ± 4 and 225 ± 8 mmHg in KP and PP groups, respectively at the age of six months. This result indicates the probable involvement of unknown other mechanisms than the blood pressure reduction due to sulfur amino acid such as methionine, the content of which is not different in KP and PP diets, and further suggest that krill which has not been popular but abundant source of protein may be utilized in men from newer aspect of non pharmacological dietary prevention of hypertension and its related common complications.