

High Protein Diet Increases Thickness of Renal Parenchyma in Resistance-Trained-Individuals

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Objectives: Commercial protein powder or supplements are particularly consumed by resistance-trained individuals. For these individuals, an estimated requirement and recommended dietary allowance (RDA) of good quality protein are 0.66 g and 0.83 g per kg body weight (BW) per day, respectively. The aim of the present study is to examine the effect of high protein intake on thickness of renal parenchyma in resistance-trained individuals in long term.

Methods: Thirty six healthy resistance-trained male volunteers participated in this study (mean age 26 ± 3.6 years, body mass index 27.1 ± 3.5). Participants were divided into three groups according to daily protein intake/BW: group 1 (n=8): 1.8 g/kg/day, group 2 (n=16): 2.5 g/kg/day and group 3 (n=12): 4 g/kg/day. They have been regularly resistance training on average of 6.5 ± 3.5 hours per week for the last 6 years. Daily protein intake of the subjects was calculated as the sum of dietary intake plus commercially protein powder. Plasma levels of blood urea nitrogen (BUN) and creatinine were measured in venous blood samples. Renal length, width, thickness and cortical thickness were obtained in longitudinal and transverse ultrasonographic scans in prone position by same radiologist. Cortical echogenicity was graded as less than (0), equal to (1) or greater than (2) liver/spleen parenchyma and loss of cortex medulla differentiation (3).

Results: Plasma levels of BUN and creatinine were similar in all groups ($p > 0.05$). Thickness of renal parenchyma in high protein intake (4 g/kg/day) group was significantly higher than in other groups ($p < 0.05$). There was a significant positive correlation between grade of cortical echogenicity and high protein intake ($p < 0.05$). There were also a significant positive correlation between renal cortical thickness and high protein intake ($p < 0.05$). There was no significant correlation between high protein intake and increased levels of creatinine ($p > 0.05$).

Conclusion: The results of this study indicate that high protein intake increases the thickness of renal parenchyma in resistance-trained individuals in long term. Daily protein intake in excessive doses and unsupervised protein powder usage can be harmful and irreversible effects on kidney in resistance-trained individuals long term.

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