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Titel des Beitrags: Effects of a diet rich in advanced glycation end products in the rat remnant kidney model

Abstract: BACKGROUND: Food-derived advanced glycation end product (AGE)-analogues, the Maillard reaction products (MRPs), are formed during heat processing. Mainly low molecular weight MRPs are absorbed partially into the circulation and subsequently excreted in urine. In the presence of renal insufficiency, their removal is impaired, with a prolonged increase in plasma levels. Although bioactivity of orally absorbed MRPs has been shown in both experimental and human studies, its relevance in renal insufficiency still is unclear. METHODS: In the rat remnant-kidney model (five-sixth nephrectomy [5/6NX]), effects of an AGE-rich and an AGE-poor diet were investigated during a period of 6 weeks and compared with effects in sham-operated healthy (control [CTRL]) rats on renal function (serum creatinine level and proteinuria). In the AGE-rich diet, 25% wt/wt of cornstarch was replaced by bread crusts. RESULTS: Despite pair feeding, the AGE-rich diet resulted in a significant increase in body weight, including weight of the kidney, liver, and heart, in both the CTRL and experimental groups. The AGE-rich diet also enhanced proteinuria in CTRL rats by a factor of 2 and in 5/6NX rats by a factor of 8. Renal function (serum creatinine level and creatinine clearance) in healthy CTRLs did not change significantly. In the 5/6NX group, glomerular filtration rate (GFR) tended to even higher
levels. CONCLUSION: Administration of an AGE-rich diet for 6 weeks does not impair GFR, but induces an increase in proteinuria, in particular, in the 5/6NX rats, indicating detrimental effects on the kidney.