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The effects of high salt or high fat diet on murine intrarenal immunologic micromilieu

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Objectives: Intrarenal immunologic micromilieu has been reported to affect renal outcome in acute kidney injury. We hypothesized that environmental factors such as diet may change intrarenal immunologic micromilieu. We investigated the effects of high salt or high fat diet on intrarenal immunologic micromilieu.

Methods: Four different diet regimen (control, high salt, high fat, and high fat & high salt diet) was provided to each group of 9-week male C57BL/6 mice, respectively (n=5 in each group). A cohort of mice were sacrificed at 1 week, 2 weeks, and 6 weeks after starting diet modification. Laboratory tests including electrolytes and cholesterol, total leukocytes infiltration into kidney as well as intrarenal lymphocytes subsets, and intrarenal cytokines / chemokines were serially analyzed.

Results: Body weight and total cholesterol levels were higher in the high fat diet group. There were no differences in CD45 positive total leukocytes analyzed by tissueFAXS and the proportion of total T cells analyzed by flow cytometry. The proportion of activated CD4 and CD8 T cells was higher in the high fat & high salt group. Effector memory CD4 T cells were also higher in the high fat & high salt group at 6 weeks. Intrarenal IFN-γ was elevated in the high fat & high salt group at 6 weeks. Intrarenal VEGF was decreased in the high salt and high fat & high salt diet groups at both 2 and 6 weeks.

Conclusions: High salt or high fat diet may exert adverse effects on intrarenal immunologic micromilieu.