Thesis Title Renal Responses to Acute Animal and Vegetable Dietary Protein Load

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ABSTRACT

This study was designed to demonstrate the effect of renal response after dietary protein load from animal and vegetable source. The study was carried in twenty healthy subjects, ten male and ten female volunteers,aged 19-25 years. The study was run in two parts with one week interval. Part one was to study the effect after animal protein load in the form of boiled chicken, and part two with vegetable protein load in the form of boiled soybean. In each meal subjects recieved equal amount of protein 1.4 gm per kg of body weight.

This study showed that after animal protein intake :

1. Serum urea, uric acid and potassium increased significantly ($p<0.01$-$p<0.001$) at 30-60 minutes after meal.

2. Thirty minutes after meal glomerular filtration rate increased significantly ($p<0.01$) with peak increase of 80% at 90 minutes ($p<0.001$) and then stepped down though still remained higher than baseline up to 240 minutes ($p<0.001$).

3. Renal excretion rate of creatinine, urea, uric acid and electrolytes increased significantly ($p<0.001$). There was strong correlation between GFR and renal excretion rate of these solutes ($r=0.82$, $p<0.001$).

After vegetable protein intake, it was demonstrated that :

1. Serum urea increased significantly ($p<0.01$) at 120 minutes and serum potassium increased significantly at 30 minutes ($p<0.001$) but serum uric acid did not rise.

2. Glomerular filtration rate increased significantly in 30 minutes ($p<0.001$) and peaked at 60 minutes with 55% increase ($p<0.001$) and then stepped down though still remained higher than baseline up to 240 minutes ($p<0.001$).

3. Renal excretion rate of creatinine, urea, uric acid and electrolytes increased significantly ($p<0.001$) at 30 minutes through 240 minutes.

Comparing the changes after animal and vegetable protein intake revealed that :

1. Urea in the blood was higher after animal protein load than after vegetable one ($p<0.01$-$p<0.001$)

2. Glomerular filtration rate rose much higher after animal protein load than after vegetable protein load ($p<0.01$-$p<0.001$).

3. Renal excretion rate of creatinine ,urea and uric acid increased much higher after animal protein load than after vegetable protein load ($p<0.001$).

4. Renal excretion rate of electrolytes were not significantly different in both groups.

It can be summarized that high protein diet either from chicken or soybean affects renal function, increasing the glomerular filtration rate and solute excretion rate, but at different magnitudes. Animal protein diet raises GFR and nitrogen waste product excretion more than does soybean which causes no rise in serum uric acid.