

Thesis Title      Effect of High Protein Diet on Renal Function  
in Young Adult and Elderly Subjects.

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#### ABSTRACT

This study was designed to compare the renal functional reserve capacity in healthy Thai young adults to the elderly aged group, which will extend our understanding in renal physiology and aging, and to provide a helpful data in taking good healthy care of the senior populations of our country whose percentage is gradually increasing. Previous studies showed that renal hyperfiltration or elevated GFR could be induced by an acute oral protein loading in normal subjects, and the increment in GFR is known as the renal functional reserve capacity. It is well known that aging induces changes both in renal function and structures. Furthermore, reduction in GFR was shown in elderly subjects. How elderly subjects renal function responses to dietary protein is interesting. Forty healthy Thai subjects were recruited and divided into two groups according to their age: 20 young adult subjects and 20 elderly subjects. Acute effect of

protein intake on GFR was investigated by comparing of baseline GFR to the GFR after meal. Baseline GFR was measured by creatinine clearance ( $C_{cr}$ ) which was determined by collecting a twenty-four hour urine specimen and a fasting blood sample in the morning. After the baseline creatinine clearance measurement, subjects ingested low protein diet (LPD) that provided 0.1 gm protein/kg BW/meal of approximately 9 kcal/BW together with water intake of 5 ml/kg/BW. Blood samples were drawn every 30 minutes within the first two hour and then every 60 minutes for the next two hours after meal. Urine was collected after each blood sample collection and the subjects then drank an equal amount of water. The procedure was repeated again within 3-6 days in each subjects using high protein diet (HPD) (1.5 gm protein / kg BW) instead of the previous LPD.

This study showed that:-

1. Baseline values of serum creatinine in both young adult and elderly subjects before LPD and HPD were not significantly different though slightly higher in the old; the values were 0.96, 0.98 mg/dl and 1.02, 1.02 mg/dl, respectively. In young adult subjects, baseline values of serum creatinine in males and females subjects in both before LPD and HPD were significantly different; the values were 1.07, 1.10 mg/dl in males and 0.86, 0.86 mg/dl in females. In elderly subjects, serum creatinine in males were also higher than those in females both before LPD and HPD though not statistically significant ; the values were 1.06, 1.07 mg/dl in males and 0.98, 0.98 mg/dl in females.

2. Baseline creatinine clearance in young adult in both before LPD and HPD were significantly higher than those of the elders. Baseline creatinine clearance in elderly subjects was 82 %, 89 % of the baseline value in the younger age groups. Baseline creatinine clearance in males both before LPD and HPD were higher than baseline creatinine clearance in females in both age groups though not statistically significant.

3. Serum creatinine after HPD were higher than serum creatinine after LPD in both age groups.

4. Creatinine clearance after HPD or the so-called "renal functional reserve" was obviously higher in the young comparing to the elders. The increment in creatinine clearance induced by an acute protein load in this study, which peaked at 30-minutes after meal, were as followed, :-

The increment in  $C_{cr}$  in young adult subjects after LPD and HPD = 62.2 % and 155.2 %, respectively.

The increment in  $C_{cr}$  in elderly subjects after LPD and HPD = 69.2 % and 88.2 %, respectively.