

**Thesis Title** Relationship of Nutrient Intakes, Renal Stone and Distal Renal Tubular Acidosis (dRTA) in the North-East of Thailand.

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#### **ABSTRACT**

The attempt of this research was to study the food consumption pattern and nutrient intake in the subjects with renal stone and distal renal tubular acidosis (dRTA) compared to normal subjects. The relationship between the nutrient intake and the pathogenesis of the diseases was assessed.

The study was performed in three villages in Khonkhan province where high incidence of renal stone and dRTA were found. Daily foods consumed by forty-four subjects (21 males and 23 females) with renal stone, dRTA and healthy normal were collected for 3 consecutive days in rainy season and in summer. Multiple composite samples of individuals, 3-day duplicate meals, were prepared and chemically analysed for nutrient and some antinutrient composition.

The study showed that the nutrient and antinutrient consumptions of subjects with renal stone, dRTA and normal control did not differ significantly. The subjects had adequate intake of energy (2000-2600 Kcal/day), however it derived from an imbalanced diet of high carbohydrate (400-450 mg/day) due to large amount (770-950 g/day) of glutinous rice consumption. Fat intake was quite low (13-18 g/day), contributing only 5-8% of total energy intake. This was mainly due to cooking methods which steaming, boiling, roasting, grilling and blanching were used. Adequate dietary protein (60-72 g/day) and phosphorus intakes (680-770 mg/day) were met but were mostly derived from plant origin which may affect their qualities and availabilities.

Low intake of animal protein, fat, calcium, sodium, oxalate and nucleic acids and high fluid intake were found among the subjects which should be beneficial for not having the risk factors in favouring stone formation. However, high incidence of renal stone and dRTA are still prevalence in this area. Blood and urine pictures of the subjects did not show typical pathogenesis of the diseases; calcium, magnesium, and phosphate in blood and calcium and uric acid in urine were within the normal ranges. However, low levels of urinary phosphate and citrate, the inhibitors for calcium stone formation, were found in all groups studied. Consumption of phosphorus mainly from plant origin may lower the availability and the amount of phosphate excreted in urine. Low potassium intake might lead to potassium deficiency and may have an important role in lowering urinary citrate excretion. From the findings, it could be suggested that consumption of imbalanced diets, regular consumption of

stone aggregators even at low concentration with inadequate quantity of stone forming inhibitors could be related to the incidence of renal stone and dRTA among the northeastern people of Thailand. The data of nutrient and antinutrient intakes obtained in this study provided basic information in understanding the ethiology of the renal stone disease. The relationship of glutinous rice consumption and the disease should be further investigated.