

Thesis Title High performance liquid chromatographic
determination of urinary citric acid cycle
intermediates in normal and diseases

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ABSTRACT

Incidence of distal renal tubular acidosis (dRTA) and urinary stone disease in Thailand is rather high, especially in the northeast of Thailand. Urinary citrate was a screening test for detecting dRTA cases. In this study, citrate and other urinary citric acid cycle intermediates such as succinate, malate, fumarate, and isocitrate were simultaneously determined in 24 hr urine specimens from 30 healthy subjects in Bangkok, 15 healthy subjects from the northeast of Thailand, 15 villagers with acidification defect, and 15 villagers with renal stone by a reversed-phase high performance liquid chromatographic method, employs a one-step esterification procedure with phenacyl bromide as esterification reagent. This simple and rapid analysis, is performed

at 254 nm with a simple eluent water-methanol mixture and gives high enough recovery to determine the urinary citric acid cycle intermediates with a high accuracy and precision. The excretion levels of citrate in both normal groups from Bangkok and Northeast, 0.48 ± 0.35 and 0.51 ± 0.48 mM, respectively, show significantly higher than acidification defect (0.10 ± 0.19 mM) and renal stone (0.20 ± 0.32 mM). Urinary succinate excretion of normal from Bangkok (0.49 ± 0.21 mM) shows significantly higher than in any other group; 0.27 ± 0.08 , 0.24 ± 0.06 , and 0.25 ± 0.13 mM for normal from northeast, acidification defect and renal stone, respectively. The urinary malate, fumarate, and isocitrate excretion show no significantly different between normal and diseases. This study also supported the using of urinary citrate excretion as a screening test for detecting dRTA cases.