

1999 9 1 10 30 CT

80 mg/dl) :53 , 5 (: =4:1, :1.5 - 3.2 mg/dl, :2.08

25 90 80 50 , 30 75 (: =46:29, :0.6 - 1.4 mg/dl, :1.00

50 (n=31), (n=9), (n=7), mg/dl) . 5 1 IgA

(n=3) CT . 30 CT 1 CT

(n=11), (n=2), (n=3) 가 CT 가 2

(n=12), (n=2) CT CT 5

CT Somatom Plus 4(Simens, Erlangen, Germany) Somatom Plus S(Simens, Erlangen, Germany) CT 75 T -

Iopromide(Ultravist 370: Schering, Berlin, Germany) 120 cc 3 cc

10.67 mm/sec 180 mAs, 100 kVp 80 CT attenuation number CT

30 40 0.49 - 0.99(: 0.79, : CT

100 housfield . CT attenuation number . Spearman rho CT

unit . CT -0.346 , 0.002 가

65 , 3 (Fig. 1). CT attenuation number

(renal hilum) 5 0.49 - 0.61(:0.54, :0.05) 75

CT number CT number 0.52 - 0.99(:0.80, :0.14)

CT number (Fig. 2 - 4). CT number T -

0.7 - 0.9 cm² 0.07 - 0.09 0.01 가 .

cm² CT number 3

80 CT number CT CT

(0.6 - 3.2 mg/dl, :1.03 mg/dl)

spearman rho .

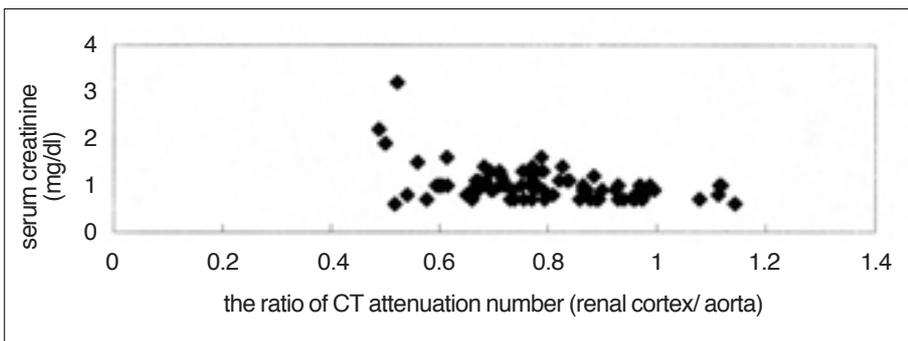


Fig. 1. The correlation of ratio of CT attenuation number (renal cortex/ aorta) with serum creatinine.

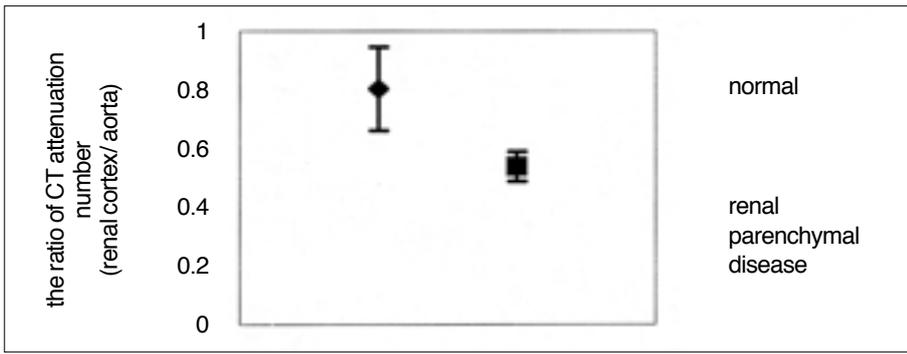


Fig. 2. The ratio of CT attenuation number (renal cortex/aorta) in renal parenchymal disease vs normal group.



Fig. 3. 54-year-old man with acute glomerulonephritis. CT attenuation number ratio (renal cortex / aorta) is 0.48.

가 CT 가 .
 , , , , ,
 , 가
 CT (7). 가
 CT 가
 가
 Tsushima 가 CT
 가 CT (8, 9). CT
 (1, 3, 4).
 ml/min 1200
 20 - 25% .
 90% 가
 10%, 1 - 2%가 CT
 가
 가
 CT number 가 가
 1.0 (96%)
 (55%)
 CT (5, 6). 가
 30 90

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Spiral CT in Kidney: Assumption of Renal Function by Objective Evaluation of Renal Cortical Enhancement¹

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Purpose: To correlate the degree of renal cortical enhancement, objectively evaluated by means of spiral CT, with the serum level of creatinine, and to determine the extent to which this degree of enhancement may be used to detect renal parenchymal disease.

Materials and Methods: Eighty patients [M:F = 50:30; age = 25 - 90, (mean 53) years] with available serum level of creatinine who underwent spiral CT between September and October 1999 were included in this study. In fifty patients the findings suggested hepatic or biliary diseases such as hepatoma, biliary cancer, or stone, while in thirty, renal diseases such as cyst, hematoma, or stone appeared to be present. Spiral CT imaging of the cortical phase was obtained at 30 - 40 seconds after the injection of 120 ml of non-ionic media at a rate of 3 ml/sec. The degree of renal cortical enhancement was calculated by dividing the CT attenuation number of renal cortex at the level of the renal hilum by the CT attenuation number of aorta at the same level. The degree of renal cortical enhancement was compared with the serum level of creatinine, and the degree of renal cortical enhancement in renal parenchymal disease with that of the normal group. Among eighty patients there were five with renal parenchymal disease and 75 with normal renal function.

Results: The ratio of the CT attenuation number of renal cortex to that of aorta at the level of the renal hilum ranged between 0.49 and 0.99 (mean, 0.79; standard deviation, 0.15), while the serum level of creatinine ranged between 0.6 and 3.2 mg/dl. There was significant correlation (coefficient of - 0.346) and a statistically significant probability of 0.002 between the ratio of the CT attenuation numbers and the serum level of creatinine. There was a significant difference (statistically significant probability of less than 0.01) between those with renal parenchymal disease and the normal group.

Conclusion: The use of spiral CT to measure the degree of renal cortical enhancement provides not only an effective index for estimating renal functional status but also a means of differentiating between patients with renal parenchymal disease and those who are normal.

Index words : Kidney, CT
Kidney, parenchymal disease
CT, spiral scanning
Objective evaluation

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