Abstract

Reliability of fractional excretion of uric acid (FE_{UA}) in acute kidney injury (AKI) and its combination with other renal failure indices

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Purpose: An early detection of adult patients with acute kidney injury may provide the opportunity to treat and prevent the extension of kidney injury. Fractional excretion of sodium (FE_{Na}) has been used in the differentiation of acute kidney injury (AKI) into traditional categories of pre-renal azotemia (PR) and acute tubular necrosis (ATN). However, many patients with PR have already received diuretics or saline at the time of diagnosis, which increase FE_{Na}. In contrast, the fractional excretion of uric acid (FE_{UA}) and urea (FE_{UN}) is less influenced by diuretics. We investigated the diagnostic significance of the FE_{UA}, FE_{UN} and FE_{Na} in differentiating between PR and ATN.

Methods: The 3 major indices (FE_{Na}, FE_{UA}, and FE_{UN}) with other conventional indices (BUN/Creat Ratio, U/Pcr and U/Pun) were calculated in 20 patients with PR and 20 patients with ATN at day 0 (D0), day 1 (D1) and day 2 (D2), sequentially.

Results: FE_{UA} (PR14.49±6.23 % vs. ATN 47.09±23.35, $p<0.001$) and FE_{UN} (PR 32.21±9.54% vs. ATN 54.97±17.14%, $p<0.001$) were lower in PR than in ATN patients. At the cut-off value of ≤1.04% FE_{Na}, sensitivity and specificity for the detection of PR was 75% and 85%, respectively. At the cut-off value of ≤39.4% FE_{UN} sensitivity and specificity for the detection of PR was 75% and 80%, respectively. At the cut-off value of ≤19.83% FE_{UA} sensitivity and specificity for

the detection of PR was 60% and 90%, respectively. When FE_{Na}, FE_{UA} and FE_{UN} were combined, sensitivity and specificity was 84% and100%, respectively.

Conclusion: FE_{UA} and FE_{UN} may be useful in differentiating between PR and ATN when FE_{Na} fail. The combination of FE_{Na}, FE_{UA} and FE_{UN} might increase diagnostic sensitivity and specificity in the differential diagnosis of AKI.

Key Words: Acute kidney failure, Fraction excretion of sodium, Urea, Uric acid.