Hyponatremia as a Predictor of Contrast Induced Nephropathy

Sejoong Kim[1, 2], Jiyoon Sung[3], Woong Chul Kang[3], Shin Young Ahn[1, 2]
Dong Ki Kim[2, 4], Ho Jun Chin[1, 2], Ki Young Na[1, 2]
Dong-wan Chae[1, 2], Kwon Wook Joo[2, 4], Jin Suk Han[2, 4]

Department of Internal Medicine[1], Seoul National University Bundang Hospital, Seongnam, Korea
Department of Internal Medicine[2], Seoul National University College of Medicine, Seoul, Korea
Department of Internal Medicine[3], Gachon University Gil Hospital, Incheon, Korea
Department of Internal Medicine[4], Seoul National University Hospital, Seoul, Korea

Background: Contrast induced nephropathy (CIN) is common complications after coronary angiography (CAG), although some preventive methods were studied. Contrast media-related hyponatremia may develop under mechanisms such as osmotic dieresis or translocational osmotic effects. However, there has been no study on hyponatremia as a mediator of CIN.

Methods: We enrolled 51 patients who undergoing CAG, and tested changes of electrolytes and renal function at hour 0, 6, 12 and 24 hours.

Results: The incidence of CIN and hyponatremia was 23.5% (12/51patients) and 15.6% (8/51 patients), respectively. CIN group has lower levels of serum sodium and higher levels of serum osmolality and osmolar gap at hour 6 and 12. At hour 24, there was no difference in serum sodium levels between the two groups. Urinary sodium excretion was slightly increased in both groups, and there was no difference. Hazard ratio of serum sodium level at hour 12 (1-mmol/L increment) to the development of CIN was 0.678 (95% confidence interval, 0.489-0.939; p=0.019) after the adjustment of age, gender, diabetes, hypertension, and contrast media amounts.

Conclusion: Transient hyponatremia, which is related to contrast media, may precede the development of CIN in patients undergoing CAG. It suggests that hyponatremia could be involved in the mechanism of CIN, and that it may be a useful predictor of CIN.

Key Words: 조영제, 급성 신손상, 저나트륨혈증
Contrast media, Acute kidney injury, Hyponatremia