S-C19

패혈증에 의해 발생한 급성 신부전으로 CRRT 치료 하는 환자에서 폐 초음파와 생체전기저항분석법으로 측정한 수분상태 평가

연세대학교 의과대학 내과학교실

한승규, 기연경, 윤창연, 한인미, 권영은, 박경숙, 이미정
오형중, 박정탁, 한승혁, 유태현, 강신욱

The Assessment of Volume Status by Bioelectrical Impedance Analysis and Lung Ultrasound in Septic AKI Patients Undergoing CRRT

Seung Gyu Han, Youn Kyung Kee, Chang-Yun Yoon, In Mee Han
Young Eun Kwon, Kyoung Sook Park, Mi Jung Lee, Hyung Jung Oh
Jung Tak Park, Seung Hyeok Han, Tae-Hyun Yoo, Shin-Wook Kang

Department of Internal Medicine, Yonsei University College of Medicine

Background: Septic acute kidney injury (AKI) is one of the serious complications in critically ill patients. The fluid status is known as a significant risk factor for mortality in patients requiring continuous renal replacement therapy (CRRT). This study was aimed to elucidate fluid status assessment by bioelectrical impedance analysis (BIA) and lung ultrasound (US) and mortality rate in septic AKI patients undergoing CRRT.

Methods: A single center prospective observational study including 39 septic AKI patients requiring CRRT was conducted between April 2014 and February 2015. BIA and lung US were performed at the time of CRRT initiation. We classified patients into survivor and non-survivor group. We measured over-hydration (OH) value in BIA and number of B-lines in lung US. Primary endpoint was 28-day mortality.

Results: The mean age was 64.6±14.1 years and male was 24 (61.5%). During the study period, 19 patients (48.7%) died. Survivor group showed significantly lower heart rate (93.7±19.1 vs. 109.2±23.7, p=0.030), weight gain, which was defined as a body weight gain per day before CRRT initiation (2.0±3.5 vs. 5.8±5.5, p=0.017), lactate (3.3±4.2 vs. 8.8±7.2, p=0.009) and Acute Physiology and Chronic Health Evaluation II (APACHE II) score (21.7±5.3 vs. 27.1±1.5, p=0.006), but higher creatinine concentration (3.7±2.0 vs. 2.0±0.7, p=0.002) compared with non-survivor group. However, there was no significant difference in volume status parameters of BIA and lung US between two groups. OH measured by BIA had significant negative correlation with mean arterial pressure (r=-0.340, p=0.034), and B-line measured by lung US was positively correlated with APACHE II score (r=0.330, p=0.040). Logistic regression analysis showed a trend that increasing OH per body mass index (odds ratio (OR) 6.18, 95% confidence interval (CI) 0.15-248.7, p=0.334) and number of B-lines (OR 1.14, 95% CI 0.80-1.63, p=0.458) were associated with increasing risk of 28-day mortality, but there was lack of statistical power.

Conclusion: OH status assessed by BIA and lung US correlated with traditional risk factors predicting poor clinical outcomes in septic AKI patients with CRRT. In addition, this study showed the potential association between OH measured by BIA and number of B-lines measured by lung US and 28-day mortality rate in critically ill patients undergoing CRRT. The large scaled prospective randomized control study is required to validate these novel assessment tools for fluid status.

Key Words: 지속성 신대체요법, 생체 전기저항 측정법, 폐 초음파
CRRT, Bioelectrical impedance, Lung ultrasound