Assessment of pleth variability index in volume changes during ultrafiltration process

Dagar S, Uzunosmanoglu H. *Turkish Journal of Emergency Medicine*. 2021;21:111-6.

OBJECTIVES: Pleth variability index (PVI) has been studied mostly in mechanically ventilated patients, and the role of PVI in predicting volume status and volume changes among spontaneously breathing patients is not clear in the literature. We hypothesized that hemodialysis (HD) can be a valid model for a simulation that can be evaluated the correlation of PVI with fluid changes in various volume states. The aim of this study was to investigate the utility of PVI for assessing volume changes in HD patients who are breathing spontaneously.

METHODS: This prospective, observational study included patients aged 18 years or older who had end-stage renal failure and presented for routine HD between December 2019 and January 2020. PVI values were measured before and after HD session. Changes in PVI levels were compared according to the amount of ultrafiltration.

RESULTS: A total of sixty patients were included. Mean PVI level before HD (20.7% ± 5%) showed a statistically significant increase to 27.7% ± 6% after HD session ($P < 0.001$). According to the amount of fluid removed during HD, the changes in PVI were statistically significant ($P = 0.015$). There was a strong correlation between ΔPVI and ultrafiltrated volume ($r = 0.744$, $P < 0.001$).

CONCLUSION: The fluid removed by HD caused increase in PVI, and the increase was strongly correlated with the amount of volume change. Bedside monitoring of PVI may provide the clinicians with useful information for monitoring the volume status in critically ill patients with spontaneous breathing.