

## Posterior reversible encephalopathy syndrome in hypertensive patient undergoing chronic hemodialysis

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Posterior reversible encephalopathy syndrome (PRES) is clinical and radiologic syndrome that accompanied by a headache, altered mental state, seizures and other neurological signs with radiologically by reversible changes on brain image. Although the pathophysiology of PRES is incompletely understood, renal failure was known as one of the risk factors. Regarding end-stage renal disease (ESRD) and PRES, only a few cases of adults on hemodialysis have been described in the literature. We report an interesting case of PRES with severe hypertension receiving chronic hemodialysis. A 55-year-old male with ESRD was admitted to our hospital due to traumatic hemothorax and performed video-assisted thoracoscopic surgery with chest tube insertion. During 3 weeks after operation, his systolic blood pressure (BP) was very huge fluctuation between 80 mmHg to 200 mmHg. Despite using anti-hypertensive medication and hemodialysis, it is very difficult to control BP and pulmonary congestion. Suddenly he was observed decreased mentality and had a seizure-like movement with pulseless electrical activity. He was returned to spontaneous rhythm after successful cardiopulmonary resuscitation for 4 minutes with comatose mentality. We found symmetrical white matter edema in posterior cerebrum in T2-weighted Brain MRI and administered anticonvulsant and performed continuous renal replacement therapy (CRRT) for 23 days to maintain systolic BP between 100 mmHg to 120 mmHg. His neurologic symptoms had disappeared completely after we controlled strict blood pressure. Hemodialysis patients presenting with severe hypertension and subsequent seizures and unconsciousness should undergo brain MRI to rule out the possibility of PRES and consider to maintain appropriate BP and volume control using CRRT.

## A higher ultrafiltration rate is associated with worsening of the left atrial volume index

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**Background:** Optimal fluid management is essential in caring hemodialysis patient. However, too rapid fluid removal and the resultant higher ultrafiltration rate (UFR) disadvantageously promote hemodynamic instability and cardiac injury. We evaluated the effects of the rapid UFR on the changes of echocardiographic left atrial volume index (LAVI) over period. **Methods:** A longitudinal observational study enrolled 124 new hemodialysis patients. Echocardiography was performed at baseline and repeated 19.7 (11.3-23.1) months apart. The changes in LAVI ( $\Delta$ LAVI/yr, mL/m<sup>2</sup>/year) were calculated, and the 75th percentile of the  $\Delta$ LAVI/yr distribution was regarded as a "pathological" increment. The UFR was expressed in mL/h/kg, and we employed a mean UFR over 30 days (approximately 12~13 treatments). **Results:** The mean inter-dialytic weight gain was 1.88±0.94 kg, and the UFR were 8.01±3.87 mL/h/kg. The significant pathological increment point in  $\Delta$ LAVI/yr was 4.87 mL/1.73 m<sup>2</sup>/yr. Correlation analysis showed that  $\Delta$ LAVI/yr was closely related to the baseline blood pressure (BP), hemoglobin level, residual renal function, and UFR. According to the ROC curve, the best cut-off of value of UFR for the predicting the pathological increment was 10 mL/h/kg, with the area under the curve of 0.712. In multivariate analysis, systolic BP, a history of coronary artery disease, hemoglobin < 10 g/dL, and high UFR were significant predictors. An increase of 1 mL/h/kg in the UFR was associated with a 22% higher risk of a worsening of the LAVI (odds ratio, 1.22; 95% confidence interval, 1.05-1.41). **Conclusions:** For patient starting hemodialysis, a rapid UFR over 10 mL/h/kg may be associated with maladaptive worsening of the LAVI, a strong predictor of long-term adverse outcomes. **Keywords:** ultrafiltration rate; left atrial volume index; mortality; hemodialysis; ESRD