中文題目: 透析中血液動力學變化可預測心血管疾病風險

英文題目: Cardiovascular autonomic control during early hemodialysis predicts hospitalized cardiovascular events in renal failure patients

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Background

Labile blood pressure (BP) was associated with increased risk of cardiovascular (CV) mortality. However, the relationship of continuous dynamics of cardiac function during hemodialysis and hospitalized CV events is not known well.

Methods

We enrolled chronic renal failure patients who received regular hemodialysis in Taipei Medical University Hospital. Each participant received continuous hemodynamic variability exam using ICON® (Osypka Medical. Inc, USA) during hemodialysis. The “beat-to-beat” hemodynamic parameters [heart rate (HR), stroke volume (SV), cardiac output (CO), and systemic vascular resistance index (SVRI)] were recorded. We prospectively followed these patients until the occurrence of hospitalized CV events (including congestive heart failure, coronary artery disease, stroke and peripheral arterial occlusive disease) or the end of study in May, 2017. Analysis was done by hourly basis and several approaches were carried out to explore the dynamical changes of these parameters.

Results

A total of 35 patients were included and the demographics were shown. 16 patients developed hospitalized CV events (study group), including congestive heart failure (n=5), coronary artery disease (n=9), stroke (n=1), and peripheral arterial occlusive disease (n=1). Patients with hospitalized CV events were compared to those without CV events (control group). There was significant difference in the 2^{nd}, 3^{rd} and 4^{th} hourly averaged coefficient variance (standard deviation/mean) of HR between groups. No significant differences were found in hourly averaged SV, CO, and SVRI. The differences between 2^{nd} and 1^{st} hour coefficient variance of SV and CO was significantly higher in the control group as compared to the study group.

Conclusions

The higher averaged coefficient variance of HR in the 2^{nd}, 3^{rd}, and 4^{th} hour; and the increase of coefficient variance of SV and CO in the early hours of hemodialysis have predictive value for lower hospitalized CV events, which implies that chronic dialysis patients who have better autonomic control system may have better CV outcome.