



# Fluid Status by Inferior Vena Cava Collapsibility Index, Chest Ultrasound and Bioimpedance Spectroscopy in Children and Adolescents on Chronic Hemodialysis

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*To the Editor:* End-stage renal disease is characterized by profound impairment in the regulation of body fluid distribution. Volume status assessment in hemodialysis is one of the challenging goals for the nephrologist; achieving an adequate post dialysis weight is challenging and patients can have chronic volume overload leading to excess morbidity and mortality. Different methods are commonly used to determine the fluid status [e.g., clinical, echocardiography, inferior vena cava (IVC) measurements, chest ultrasound, or bioimpedance analysis] that can aid in assessment of fluid removal objectively [1–4].

This prospective cohort study was performed on children undergoing hemodialysis (HD) and their clinical evaluation, lung and IVC collapsibility ultrasound and thoracic bioimpedance by ICON electrical cardiometry within 15 min before and after dialysis was done for hemodynamic status assessment. Correlation analysis between these findings was done.

We found a statistically significant relation between overload clinical signs (edema and respiratory distress) and each of B lines  $p < 0.001^{**}$ , IVC collapsibility index  $p < 0.001^{**}$  and TFC (thoracic fluid content by ICON)  $p = 0.038^{**}$ . (A statistically significant negative correlation was found between thoracic fluid content and IVC collapsibility index after dialysis  $r = 0.748$   $p < 0.001^{**}$ ; A statistically significant negative correlation was found between B lines and IVC collapsibility index after dialysis  $r = 0.579$ ,  $p < 0.001^{**}$ ; A significant positive correlation was found between B lines

and thoracic fluid content by cardiometry after dialysis  $r = 0.533$ ,  $p < 0.001^{**}$ ). Dry weight changes were noted in 41% patients with the help of radiological methods.

To conclude, non-invasive novel techniques are valuable, safe in fluid status evaluation in children on hemodialysis for better management of hemodynamic and better dry weight targeting. These methods are confirmatory to the clinical data and to each other.

## Declarations

**Conflict of Interest** None.

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