

Original Article

Towards improved cardiovascular management: the necessity of combining blood pressure and fluid overload

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Abstract

Background. Hypertension and fluid overload (FO) are well-recognized problems in the chronic kidney disease (CKD) population. While the prevalence of hypertension is well documented, little is known about the severity of FO in this population.

Methods. A new bioimpedance spectroscopy device (BCM—Body Composition Monitor) was selected that allows quantitative determination of the deviation in hydration status from normal ranges (Δ HS). Pre-dialysis systolic blood pressure (BP_{sys}) and Δ HS was analysed in 500 haemodialysis patients from eight dialysis centres. A graphical tool (HRP—hydration reference plot) was devised allowing Δ HS to be combined with measurements of BP_{sys} enabling comparison with a matched healthy population ($n = 1244$).

Results. Nineteen percent of patients ($n = 95$) were found to have normal BP_{sys} and Δ HS in the normal range. Approximately one-third of patients ($n = 133$) exhibited reasonable control of BP_{sys} and fluids (BP_{sys} < 150 mmHg and Δ HS < 2.5 L). In only 15% of patients ($n = 74$) was hypertension observed (BP_{sys} > 150 mmHg) with a concomitant Δ HS > 2.5 L (possible volume-dependent hypertension). In contrast, 13% of patients ($n = 69$) were hypertensive with Δ HS < 1.1 L (possible essential hypertension). In 10% of patients ($n = 52$), BP_{sys} < 140 mmHg was recorded despite Δ HS exceeding 2.5 L.

Conclusion. Our study illustrated the wide variability in BP_{sys} regardless of the degree of Δ HS. The HRP provides an invaluable tool for classifying patients in terms of BP_{sys} and Δ HS and the proximity of these parameters to reference ranges. This represents an important step towards more objective choice of strategies for the optimal treatment of hypertension and FO. Further studies are required to assess the prognostic and therapeutic role of the HRP.

Keywords: bioimpedance spectroscopy; fluid status; fluid overload; haemodialysis; hypertension

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