

How to assess patients in two graphics? Assessment tools for hydration and nutrition status

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Introduction

Multi-frequency bioimpedance spectroscopy (BIS) is a non-invasive method of determining hydration and nutrition status in haemodialysis patients. The application of this method has been increasing constantly over the past few years, most probably due to a software tool which allows monitoring of hydration and nutritional status via user-friendly plots.

Objectives

Differentiation of patient groups based on their hydration and nutrition status using graphical tools in two measurement intervals of one year.

Methods

Generation of graphical tools – Hydration Reference Plot and Nutrition Reference Plot – from selected BIS measurement results taken in two periods of one year in a single haemodialysis clinic. Data were collected during January and July 2015. All available patients' data were included in this plots. Excluded patients were those with contraindications for measurements and those without data. Red lines in the plots represents the limit values for hypo/hyper-hydration (Overhydration +1.1L) and hypo/hypertension (Blood pressure 140 mmHg)¹. For nutritional graph, red markers are on the position above lowest reference range criteria (Lean Tissue index > 12 kg/m²)².

Results

BIS measurement results presented with Hydration Reference Plot and Nutrition Reference Plot. These plots show an easy-to-understand picture for one clinic within a specific period. Most of the patients are in quadrant I. There is no significant difference between summer and winter data for quadrant I, however there is more patients for summer measurements.

Conclusion

BIS provides reliable support to a haemodialysis unit's medical team in the management of fluid and protein energy waste of their patients. Using graphical tools like Hydration Reference Plot and Nutrition Reference Plot helps one to interpret results simply and rapidly.

Graphical plots for our clinic showed that the majority of the patients were in a hyperhydrated and hypertensive status. Some patients that required more effort to reduce their overhydration because of an associated hypotension. Others, with energy protein loss, need to be monitored more frequently. There was no statistically significant difference in hyperhydration nor Lean Tissue Index between winter and summer measurements.

Future usage of this tool should assure further and more detailed conclusions.

References

1. Wabel P. Towards improved cardiovascular management: the necessity of combining blood pressure and fluid overload. *Nephrol Dial Transplant* (2008) 23: 2965–297.
2. BCM-Body Composition Monitor information web page <http://bcm-fresenius.com/23.htm> Visited 01.07.2016.

