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J Clin Exp Cardiolog 2017, 8:11 (Suppl)
DOI: 10.4172/2155-9880-C1-084

Lack of correlation between fluid removal and changes in serum natriuretic peptide levels in patients with acute heart failure treated with ultrafiltration

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Background: Fluid removal is the primary goal in congested patients admitted for acute decompensated heart failure (ADHF). Ultrafiltration (UF) has emerged as an efficacious therapeutic strategy in this setting but there is a paucity of data on appropriate methods for objective monitoring of decongestion by this therapy. We previously reported on the strong correlation between weight loss and fluid removal in these patients. In this study, we sought to determine whether changes in serum B-type natriuretic peptide (BNP) can be helpful in this setting.

Methods: Available data from clinical trials of UF in ADHF performed between January 2000 and December 2016 were included in the analysis. These studies evaluated decongestion through both fluid removal and BNP or N-Terminal BNP (NT-proBNP). Pertinent data were extracted and using Spearman's rank correlation analysis, the degree of dependence and correlation between these two variables was determined.

Results: A total of 345 patients from 6 studies (4 randomized controlled trials) were included. The mean age was 67.9 years. Two studies reported NT-proBNP while the other 4 measured BNP before and after ultrafiltration therapy. Fluid removal ranged from 5.2 to 18.7 L (mean 10.1±4.6) and reduction in natriuretic peptide levels ranged from 211 to 3266 pg/ml (mean 1212±57). There was no correlation between fluid removal and changes in natriuretic peptide levels (r=- 0.6, p=0.2).

Conclusion: Currently available evidence suggests that no correlation exists between fluid removal and changes in serum natriuretic peptides in patients with ADHF who undergo UF therapy. Therefore, use of natriuretic peptides to monitor the degree of decongestion cannot be recommended for these patients. Future studies are needed to clarify whether combining a multitude of these parameters could help improve their efficacy in guiding decongestion with UF therapy in ADHF.

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