

Abstract Type : Poster

Abstract Submission No. : PO-1510

Effect of Diet Education in the Management of Higher Interdialytic Weight Gain and Predialysis Blood Pressure among Hemodialysis Patients: Network Review Using Recent Data

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Objectives: Interdialytic weight gain should be maintained between dialysis treatment to minimize unnecessary accumulation of harmful toxins, electrolytes and fluid. Higher IDWG may cause higher pre-dialytic BP, greater intradialytic reductions in BP (hypotension risk) as a result of higher ultrafiltrate on rates and increasing mortality risk. However, IDWG and BP can be managed by dietary and fluid restriction between dialysis treatment. The aim of this review was to discuss the effectivity of diet education on interdialytic weight gain and blood pressure change among hemodialysis (HD) patients based on recent studies.

Methods: The preparation of review was obtained from the analysis and synthesis of various journals. Three recent studies were found on PubMed Medline and Google Scholar with the main search terms are "interdialytic weight gain", "blood pressure", "diet education".

Results: Diet educational intervention on hemodialysis patients concern on salt and fluid restriction. Those intervention conducted by registered dietitian and/or nephrology nurse at the bedside patient during hemodialysis session. Result of three reviewed-studies showed the decreasing of IDWG or IDWG ratio after diet education after 2-month periods and 48-month periods of intervention. Diet education that focused on salt and fluid restriction also leads on decreasing of pre-dialytic blood pressure but not all of the studies showed significantly difference after intervention. It contributed on decreasing of dosage of antihypertensive drugs among patients that experienced improvement of IDWG ratio. Based on nutritional parameter, there was significantly difference between creatinine amount after 2-month intervention ($p \leq 0.01$). Meanwhile, estimated salt and water intake showed significantly decreasing from 13.3 ± 2.7 to 11.8 ± 2.4 g/day and 2528 ± 455 to 2332 ± 410 ml/day, respectively ($p < 0.05$) after 48-month nutritional counseling.

Conclusions: Diet educational intervention may contribute on decreasing of IDWG, IDWG ratio, predialysis blood pressure among hemodialysis patients. Diet education session during hemodialysis treatment also improve nutritional status and nutrition intake especially salt and water intake.

Table of Review Article

Table 1. Review of Diet Educational Intervention and Patient Outcome

Title of Article	Subject criteria and sample size	Diet Education Intervention	Design Study	Result
Fluid Compliance among Patients Having Haemodialysis: can an educational programme make a difference? (Barnett et al, 2007)	26 adults hemodialysis patients with an interdialytic weight gain of greater than 2,5 kg over 2 month period	Diet education included teaching and weekly reinforcement about diet, fluids, and control of weight gain by nephrology nurse for 26 dialysis treatment	Quasi-experimental	Significantly different of the mean IDWG: 2,64 kg to 2,21 kg after 2-month periods of educational intervention ($t=6.15, 25, p < 0,05$) No significantly difference in pre-dialysis mean blood pressure (both of SBP and DBP)
Effect of Diet Education on Blood Pressure Changes and Interdialytic Weight in Hemodialysis Patients Admitted in Hajar Hospital in Shahrekord (Jafari et al, 2014)	100 dialysis patients over 2-month period	Face-to-face interview, bulletins, pamphlets and educational CD. Diet education was concerned with the control of salt and fluid intake, and the right way of food consumption. Monitoring: pre-dialysis body weight and blood pressure (every 2 weeks after intervention), questionnaire of proper diet and nutrition (at the end of the month after intervention)	Quasi-experimental	The mean pre-dialytic body weight decreased from 66.15 \pm 15.10 to 64.43 \pm 14.67 ($p < 0.002$) Significantly difference of the mean of SBP before and after intervention: 134.0 \pm 17.70 to 128.2 \pm 13.08 ($p \leq 0.05$) The mean of DBP reduced to 2.24 \pm 1.82 ($p \leq 0.20$) Significantly difference between creatinine amount before and after training ($p \leq 0.01$)
Nutritional Counseling Regulates Interdialytic Weight Gain and Blood Pressure in Outpatients Receiving Maintenance Hemodialysis (Sakai et al, 2017)	48 dialysis patients who had monthly IDWG ratio exceeded 5,1% and who had not hospitalized over 1 month	Subject received 48-month nutritional counseling by registered dietitian. At the beginning session, patients were measured clinical data to identify potential problems. Monthly nutritional counseling conducted at patient bedside during hemodialysis session. Nutritional counseling should explain these following items: relationship between sodium and IDWG, sodium and/or water rich foods, high-calorie foods, water and/or salt restriction.	Quasi-experimental	The IDWG ratio decreased from 6.0 \pm 0.7% to 5,3 \pm 0.9% ($p < 0.05$) Estimated salt and water intake significantly decreased from 13.3 \pm 2.7 to 11.8 \pm 2.4 g/day and 2528 \pm 455 to 2332 \pm 410 ml/day, respectively ($p < 0.05$). Pre-dialysis SBP and DBP significantly decreased from 149 \pm 19 to 134 \pm 18 mmHg, and 82 \pm 13 to 75 \pm 10 mmHg, respectively ($p < 0.05$) Dosage of antihypertensive drugs had significantly decreased to the group that experienced improvement of IDWG ratio.