



DOES INTERDIALYTIC WEIGHT GAIN EFFECT HEMOGLOBIN VARIABILITY?

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Introduction and Objectives

There are studies showing, hemoglobin (Hgb) variability increase mortality in hemodialysis (HD) patients. As volume changes known to have an effect on Hgb concentration, volume status must be take into account on Hgb variability definition.

Methods

Present study 552 prevalent HD patients of 62.5% men, being treated at five HD centers in Aegean region with the age of 64±15 years were included. In between 2013-2014 baseline demographic, every 6 months of laboratory, and monthly all therapy sessions data were prospectively followed unattended. "Adjusted Hgb = Hgb * HD input kg / HD output kg" formula used for calculation. Hgb (g/dl) may be lower (L): <11, moderate (M): 11-12, high (H):> 12, the stable group LL, MM, HH; variable groups: LM, LH and MH are classified.

Pearson correlation test, Student's t test and nonparametric tests (Kruskal Wallis, Man Whitney U test) were used for statistical evaluation. P <0.05 was considered as significant.

Results

There are significant shifts in Hgb variability between groups after Hgb corrections. In variable groups, after correction 83.9% LH, 75.9% HM, 53.9% LM of patients remained already in their group. Stable groups, 76% HH, 33.4% MM, 77.1% LL of patients remaining stuck in their group of the remaining shifted to other groups. Many patients thought to have been in Hgb variability groups in fact changed to stable group if volume status taken into account and vice versa is also valid but in much less patients.

Interdialytic weight gain (IDWG) at weekday, weekend and IDWG/DW % at weekend were less in Hgb variability group compared to stable group but non significant at weekday. According to corrected hemoglobin it decreased but weekday IDWG/DW% gained significant differences (Table).

In Hgb variability group IDWG/DW % 3.16±1.1 was more than stability group 3.11±1.3 unsignificantly according to adjusted Hgb.

Table 1: Weight gain differences according to hemoglobin stability groups

		N	Mean	Sd	P
IDWG_WD	LL	140	1.795	0.768	0.043
	MM	14	2.101	0.800	
	HH	48	2.159	0.828	
	LM	266	1.997	0.795	
	HM	135	1.953	0.779	
	LH	471	1.946	0.724	
	Total	1074	1.952	0.763	
IDWG_WE	LL	140	2.207	0.984	0.030
	MM	14	2.684	1.118	
	HH	48	2.740	0.952	
	LM	266	2.514	0.978	
	HM	135	2.522	0.997	
	LH	471	2.490	0.921	
	Total	1074	2.477	0.962	
IDWG/DW%_WD	LL	140	2.714	1.115	NS
	MM	14	2.953	1.059	
	HH	48	2.983	1.025	
	LM	267	2.960	1.132	
	HM	135	2.735	0.958	
	LH	471	2.890	0.983	
	Total	1075	2.870	1.041	
IDWG/DW%_WE	LL	140	3.356	1.492	0.029
	MM	14	3.755	1.541	
	HH	48	3.814	1.268	
	LM	267	3.690	1.317	
	HM	135	3.526	1.210	
	LH	471	3.699	1.312	
	Total	1075	3.636	1.330	

Table 2: Weight gain differences according to adjusted hemoglobin stability groups

		N	Mean	Sd	P
IDWG_WD	Adjusted LL	111	1.787	0.691	0.000
	Adjusted MM	19	1.876	1.057	
	Adjusted HH	64	2.298	0.777	
	Adjusted LM	175	1.914	0.825	
	Adjusted HM	193	2.044	0.760	
	Adjusted LH	503	1.937	0.726	
	Total	1065	1.958	0.761	
IDWG_WE	Adjusted LL	111	2.215	0.934	0.000
	Adjusted MM	19	2.367	1.204	
	Adjusted HH	64	2.900	0.892	
	Adjusted LM	175	2.392	1.054	
	Adjusted HM	193	2.616	0.934	
	Adjusted LH	503	2.479	0.913	
	Total	1065	2.485	0.958	
IDWG/DW%_WD	Adjusted LL	111	2.713	1.111	0.042
	Adjusted MM	19	2.852	1.728	
	Adjusted HH	64	3.119	0.973	
	Adjusted LM	176	2.846	1.146	
	Adjusted HM	193	2.929	1.007	
	Adjusted LH	503	2.876	0.967	
	Total	1066	2.878	1.039	
IDWG/DW%_WE	Adjusted LL	111	3.372	1.484	0.015
	Adjusted MM	19	3.603	1.609	
	Adjusted HH	64	3.951	1.176	
	Adjusted LM	176	3.516	1.407	
	Adjusted HM	193	3.738	1.261	
	Adjusted LH	503	3.682	1.276	
	Total	1066	3.647	1.323	

IDWG: Interdialytic weight gain, WD: Week day, WE: Weekend, L: Lower, M: Moderate, H: Higher

Conclusion

In HD patients IDWG/DW % must be used instead of IDWG for hypervolemia. Hemoglobin variability diagnosis needs the adjustment according to volume status. Volume status of Hgb variability group is worse and increased mortality of patients must not be considered without it.

