



INTERDIALYTIC WEIGHT GAIN AND HEART DAMAGE IN HEMODIALYSIS PATIENTS: ARE WE TELLING A TRUE STORY?

Alessandro Palermo, Paola Cusimano and Grazia Locascio
Centro Emodialitico Meridionale, Dialysis Unit – Palermo, Italy

Topic: Dialysis – Cardiovascular complications I

Introduction and objectives

In some previous studies on hemodialysis patients, interdialytic weight gain (IDWG), volume overload and high ultrafiltration rates were associated with higher risk of cardiovascular events and mortality (1-3). However, the topic is still a matter of debate since IDWG itself seems to play as a marker of better nutritional status and of general health condition in this population (4-6). The aim of our study was to evaluate the changes of echocardiographic parameters in a population of hemodialysis patients, divided according to IDWG higher or lower than 3.5%; this cut-off was chosen on the basis of previous studies on the topic (1).

Methods

This was a retrospective study evaluating echocardiographic examinations performed at the start of dialysis and after 1 year and 3 years of follow-up on chronic hemodialysis. Among the prevalent hemodialysis patients chronically referred to our center, 55 patients met the inclusion criteria and were included in the study. To mitigate the possible variability of IDWG over short periods, IDWG for each patient was calculated as the average IDWG of the last six months. Then, to erase the influence of different body sizes, we considered percentage IDWG, obtained as the ratio of absolute IDWG to dry weight. Echocardiography was performed on a non-dialysis day (short interdialytic period).

Table 1
Basal clinical and echocardiographic data of patients with IDWG > 3,5% and <3,5%

	IDWG > 3,5% N= 24	IDWG < 3,5% N= 31	P
Age (years)	66.2 ± 13	68 ± 13	ns
Males (%)	50	58	ns
Diabetes (%)	37.5	45.1	ns
SBP (mmHg)	138.8 ± 18.2	130.7 ± 18.6	ns
DBP (mmHg)	69.2 ± 13.3	65.3 ± 13.6	ns
Dialysis vintage (months)	72.5 ± 45	69 ± 43.4	ns
kt/V	1.45 ± 0.21	1.46 ± 0.2	ns
IDWG (%)	4.36 ± 0.83	2.68 ± 0.48	< 0.0001
Hemoglobin (g/dl)	10.6 ± 0.99	10.5 ± 0.65	ns
Serum glucose (mg/dl)	106.9 ± 30.6	123.4 ± 47.3	ns
UF/h (ml)	890.4 ± 92.4	711.9 ± 124.3	< 0.0001
LVDD (mm)	47.7 ± 6.8	49.6 ± 5.7	ns
IVS (mm)	12.1 ± 1.9	12.05 ± 1.6	ns
PW (mm)	11.7 ± 1.9	11.7 ± 1.25	ns
EF (%)	56.1 ± 6.9	55.9 ± 6.9	ns
LAD (mm)	39.9 ± 5.3	40.2 ± 9.1	ns
Aorta (mm)	34.1 ± 5	33.9 ± 4.9	ns
E-vel (msec)	0.81 ± 0.32	0.78 ± 0.26	ns
A-vel (msec)	0.91 ± 0.2	0.93 ± 0.3	ns

Table 2
Echocardiographic data at 1 year and 3 year-controls in patients with IDWG > 3,5% and <3,5%

	IDWG > 3,5% N= 24	IDWG < 3,5% N= 31	P
After 1 year			
LVDD (mm)	48.1 ± 6.3	48.8 ± 4	ns
Δ vs basal (%)	2.92 ± 11.9	0.23 ± 8.7	ns
IVS (mm)	11.9 ± 1.4	12 ± 1.7	ns
PW (mm)	11.3 ± 1.3	11.3 ± 1.5	ns
EF (%)	55.7 ± 8	57.8 ± 6	ns
LAD (mm)	37.5 ± 5	40 ± 4	ns
Aorta (mm)	34.2 ± 4.55	34 ± 5	ns
E-vel (msec)	0.87 ± 0.23	0.75 ± 0.27	ns
A-vel (msec)	0.97 ± 0.18	0.8 ± 0.18	0.001
After 3 years			
LVDD (mm)	47.6 ± 3.75	49.3 ± 4.2	ns
Δ vs basal (%)	0.77 ± 14.6	-2 ± 12	ns
Δ vs 1 year (%)	5.26 ± 11.9	-0.3 ± 9.65	ns
IVS (mm)	11.9 ± 0.83	12.3 ± 2	ns
PW (mm)	11.7 ± 0.78	11.1 ± 1.43	ns
EF (%)	57.5 ± 7.6	54.6 ± 8.56	ns
LAD (mm)	41.8 ± 6.86	39.3 ± 4.2	ns
Aorta (mm)	36 ± 4.6	35.8 ± 5.2	ns
E-vel (msec)	0.84 ± 0.15	0.91 ± 0.46	ns
A-vel (msec)	0.94 ± 0.08	0.99 ± 0.17	ns

LVDD= left ventricular end-diastolic diameter. IVS= interventricular septum wall thickness. PW= posterior wall thickness. EF= ejection fraction. LAD= left atrium diameter. E= E-wave peak velocity. A= A-wave peak velocity

Results and Conclusions

The two subgroups did not show any statistical difference with regard to demographic, clinical and dialytic characteristics (except the ultrafiltration rate, which was significantly higher in the group with IDWG>3.5%, as expected) and to basal echocardiographic parameters. Moreover, also the echocardiographic data after 1 year and 3 years of hemodialysis did not show any significant difference between the two groups, except for diastolic function, which resulted as slightly worse after 1 year in the group with IDWG <3.5%; this result was not confirmed after 3 years. In conclusion, with all the limitation of a small-size sample, our data do not seem to show a faster worsening of heart structure and function in hemodialysis patients with higher IDWG.

References

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