



RELATIONSHIP BETWEEN INTERDIALYTIC WEIGHT GAIN AND PRE HEMODIALYSIS BLOOD PRESSURE IN HEMODIALYSIS PATIENTS

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ABSTRACT

Interdialytic weight gain in patients with hemodialysis depends on fluid, salt intake in interdialytic period and compliance of dialysis patients. In end stage renal disease(ESRD) patients due to decreased and absent residual urine output there is salt and water retention in body which leads to interdialytic weight gain. Overhydration and IDWG is assumed to be the main cause of pre hemodialysis raised blood pressure(BP) in ESRD patients. Here the relationship between IDWG and pre HD blood pressure is studied in 40 hemodialysis patients. We recorded pre HD BP and IDWG in four subsequent hemodialysis sessions for each patient during the period of 2 weeks in patients who are on twice weekly hemodialysis. so, in total we studied 160 hemodialysis sessions. Mean of four pre HD BP is compared with mean of four IDWG for each patient. Then correlation between 40 mean IDWG and 40 mean pre HD BP is studied and also correlation between IDWG and pre HD blood pressure during 160 hemodialysis sessions studied individually.

KEYWORDS : Interdialytic weight gain(IDWG), Hemodialysis(HD), Blood pressure(BP), End stage renal disease(ESRD), Chronic kidney disease(CKD)

INTRODUCTION-

Correlation between interdialytic weight gain(IDWG) and hypertension is poorly studied. While Some report salt and water retention as the main cause of HTN, others report no correlation between fluid retention and hypertension. Higher interdialytic weight gain is associated with adverse outcomes and higher mortality in hemodialysis patients. Increased salt and water intake in interdialytic period, decreased to absent residual urine output in ESRD patients, poor compliance to medication may result in higher interdialytic weights and HTN. Ultrafiltrate volume during hemodialysis largely depends on interdialytic weight gain. Fluid restriction, salt restriction and better compliance to medication counts in reducing interdialytic weight gain which reduces blood pressure and mortality in hemodialysis patients.

PATIENTS AND METHODS- study was done in hemodialysis patients of Kamineni Institute Of Medical Sciences, Narketpally. This is a retrospective, longitudinal study with four repeated observations obtained from 40 hemodialysis patients. Patients who are stable, not hospitalized and taking same antihypertensive medication during standard period of 2 weeks. Patients who are on twice weekly dialysis are taken into consideration.

We analysed data which is usually collected as part of routine clinical care. Data collected include patient age, sex, weight before and after hemodialysis, blood pressure before hemodialysis, interdialytic weight gain(IDWG) which is present pre dialysis weight -previous post dialysis weight and percentage of interdialytic weight gain calculated dry weight. Patients were counselled on diet recommendations like salt and fluid restriction.

Correlation between interdialytic weight gain(IDWG) and pre hemodialysis systolic and diastolic blood pressures were seen. Pearson correlation is used to find out relationship between variables.

INCLUSION CRITERIA -

All patients above 18 years of age who were on twice weekly hemodialysis and taking same antihypertensives (T.NIFEDIPINE 20MG per day) were included in this study

EXCLUSION CRITERIA -

Patients who were on three weekly hemodialysis

Patients who were in paediatric age group (< 18 years of age)

Patients who were on different antihypertensives other than T.NIFEDIPINE 20MG per day

RESULTS AND DISCUSSION-

A total of 40 hemodialysis patients were studied for 4 subsequent hemodialysis during a period of 2 weeks. Collected data is analysed as below

TABLE 1. DISTRIBUTION OF STUDY GROUP CASES ACCORDING TO PATIENT'S GENDER

Patient's gender	Number of patients (n=40)	Percentage (%)
Males	31	77.5
Females	9	22.5
Total	40	100

TABLE 2. DISTRIBUTION OF STUDY GROUP CASES ACCORDING TO DIFFERENT AGE GROUPS

Age group in years	Number of patients (n = 40)	Percentage (%)
19 - 39	10	25
40 - 59	20	50
60 - 79	10	25
80 - 99	0	0
Total	40	100

TABLE 3: DISTRIBUTION OF STUDY GROUP CASES ACCORDING TO BODY WEIGHT

Body weight range in kilograms	Number of cases (n= 40)	Percentage (%)
35 - 59	24	60
60 - 79	16	40
80 - 99	0	0
Total	40	100

TABLE 4: DISTRIBUTION OF CASES ACCORDING TO MEAN PRE HEMODIALYSIS SYSTOLIC BLOOD PRESSURES

Mean pre HD systolic blood pressures in mm of hg	Number of cases (n=40)	Percentage (%)
100 - 129	5	12.5
130 - 159	20	50
160 - 199	15	37.5
200 - 230	0	0
Total	40	100

TABLE 5 : DISTRIBUTION OF CASES BASED ON MEAN PRE HEMODIALYSIS DIASTOLIC BLOOD PRESSURE

MEAN PRE HD DIASTOLIC BP IN MM OF HG	NUMBER OF CASES (n= 40)	PERCENTAGE (%)
70	2	5
80	13	32.5
90	22	55
100	3	7.5
TOTAL	40	100

TABLE 5 : DISTRIBUTION OF CASES ACCORDING TO MEAN INTERDIALYTIC WEIGHT GAIN (IDWG)

Mean interdialytic weight gain(IDWG) in kilograms	Number of cases (n = 40)	Percentage (%)
0 – 0.9	5	12.5
1 – 1.9	6	15
2 – 2.9	7	17.5
3 – 3.9	13	32.5
4 – 4.9	9	22.5
Total	40	100

TABLE 6 : CORRELATION BETWEEN MEAN IDWG AND MEAN PRE HD BLOOD PRESSURES IN STUDY GROUP

Mean interdialytic weight gain (IDWG) in kilograms	Individual mean pre HD blood pressures in mm of hg	Total
0 – 0.9	150/90, 120/80, 140/80, 120/80,110/80	5
1 – 1.9	140/80, 120/80, 160/90, 120/90, 150/90, 140/80	6
2 – 2.9	150/90, 140/70, 140/90, 140/90, 150/90, 160/90 170/90	7
3 – 3.9	160/90, 150/80, 140/90, 180/80, 160/90, 170/90 170/70, 140/90, 160/90, 150/90, 150/100,160/90 150/100	13
4 – 4.9	140/90, 170/80, 160/90, 150/80, 140/80, 150/80 170/90, 160/80, 170/100	9
Total		40

MASTER CHART

Age In Years	Gender	Dry Body Weight In Kilograms	Interdialytic Weight Gain (idwg) In Kilograms				Mean Idwg	Pre Hemodialysis Blood Pressure (pre Hd Bp) In Mm Of Hg				Mean Pre Hd Bp
55	male	60	4	4.5	4	4	4.12	140/90	140/90	150/80	140/80	140/90
50	male	55	3	5	5	5	4.5	180/90	180/90	150/80	150/70	170/80
45	Male	58	2.5	2	3	2	2.37	140/90	140/90	160/90	160/90	150/90
48	male	57	4	3.5	4.5	4	4	160/80	160/90	160/90	160/90	160/90
65	female	72	2	2	0.5	2	1.6	130/80	140/80	140/70	140/70	140/80
50	male	65	3	3	3	5	3.5	130/80	160/90	140/90	190/90	160/90
50	male	55	4	3	4.5	5	4	130/80	160/90	140/70	170/80	150/80
30	male	50	4	5	4	3	4	180/90	130/80	110/70	140/90	140/80
45	male	67	0	0.5	0.5	0	0.25	150/90	150/90	150/80	130/90	150/90
48	male	55	3	2	3.5	4	3	160/80	150/80	130/80	150/90	150/80
36	male	57	5.5	4	4	3	4	160/90	150/80	150/80	140/70	150/80
29	female	60	2	2	4	3	3	120/80	130/80	180/110	140/90	140/90
49	male	70	3	3.5	4	3.5	3.5	170/90	180/90	180/90	170/60	180/80
42	male	68	5	4	4	4	4	180/90	160/90	170/80	150/90	170/90
72	male	70	2	2	2	2.5	2	140/90	150/50	140/60	140/90	140/70
60	female	40	1	4	3	2	2.5	130/80	160/90	160/90	120/80	140/90
66	male	52	0.5	1	2.5	1	1.3	140/90	110/70	120/80	100/60	120/80
49	male	67	3	3	2.5	3	3	160/90	160/90	150/90	160/90	160/90
70	male	68	4	2	1	1	2	150/100	140/90	130/80	130/80	140/90
58	male	60	0.5	0.5	0.5	0.5	0.5	120/80	120/80	120/80	120/80	120/80
46	male	62	3	3	3	5	3.5	160/90	180/110	170/80	180/90	170/90
66	male	35	1	0.5	1	0.5	0.75	140/90	100/60	140/80	160/80	140/80
34	male	47	0.3	2	2	0.5	1.2	140/90	160/90	160/80	160/90	160/90
60	male	54	2	2	2	2	2	160/90	140/90	140/90	150/90	150/90
32	female	45	0.5	1	1	1	1	140/90	100/90	120/80	110/80	120/90
55	male	54	3	2	2	2	3.2	170/70	160/70	180/80	160/70	170/70
24	female	44	0.3	0.5	0.5	0.5	0.5	110/80	130/80	120/80	110/70	120/80
48	male	60	0.5	1	1.5	2	1.25	130/80	140/90	160/80	180/100	150/90
52	male	66	2.5	2	4	3	2.8	160/90	150/80	160/90	160/90	160/90
50	male	50	4	5	5	5	4.75	170/90	150/70	150/80	180/90	160/80
56	male	48	2.5	3	0.5	1	1.75	110/70	160/90	140/80	140/90	140/80
52	female	60	3	5	3.5	2	3.3	160/90	170/90	120/80	120/80	140/90
47	male	56	4	2	5	4	3.75	150/90	150/90	160/80	160/80	160/90
45	female	43	3.5	3	3.5	3	3.25	150/80	140/90	160/100	140/80	150/90
60	male	54	4.5	3.5	1.3	1.3	2.6	170/90	160/90	180/90	170/90	170/90
68	female	39	3	3	2.5	3.5	3	150/100	140/90	150/90	150/100	150/100
33	female	47	3	3	3.2	2.8	3	160/80	160/80	150/90	170/90	160/90
50	male	52	4	3.5	4.5	4	4	130/90	140/90	140/90	150/100	140/90
45	male	62	3	2.5	3	3.5	3	140/90	140/90	150/100	150/100	150/100
50	male	72	4.5	5	4.5	5	4.75	160/90	170/90	160/100	170/100	170/100

RESULTS AND DISCUSSION:**POSITIVE SIGNIFICANT CORRELATION BETWEEN INTERDIALYTIC WEIGHT GAIN (IDWG) AND PRE HEMODIALYSIS SYSTOLIC BLOOD PRESSURE IS SEEN**

When correlation between 40 mean pre hemodialysis systolic blood pressures and 40 mean Interdialytic weight gains is calculated using Pearson correlation, results obtained shows highly significant correlation with p value < 0.0001

Correlation between 40 mean pre hemodialysis systolic blood pressures and 40 mean IDWG% (present pre hemodialysis weight – previous post hemodialysis weight / dry weight * 100) also shows significant correlation with P value < 0.002

Correlation between 160 pre hemodialysis systolic blood pressures and 160 interdialytic weight gains (IDWG) were compared independently without calculating mean value in each patient, which also showed highly significant correlation with P value < 0.0001

NO SIGNIFICANT CORRELATION BETWEEN PRE HEMODIALYSIS DIASTOLIC BLOOD PRESSURES AND INTERDIALYTIC WEIGHT GAIN

Correlation between 40 mean pre hemodialysis diastolic blood pressures and 40 mean IDWG'S is non significant with P value 0.3

Correlation between 40 mean pre hemodialysis diastolic blood pressures and 40 mean IDWG % is also non significant with P value 0.4

But correlation between 160 pre hemodialysis diastolic blood pressures with 160 IDWG'S is significant with p value < 0.01

REFERENCES

1. Relationship between interdialytic weight gain and blood pressure among prevalent hemodialysis patients
2. Inrig JK, Patel UD, Gillespie BS, Hasselblad V, Himmelfarb J, Reddan D, Lindsay RM, Winchester JF, Stivelman J, Toto R, Szczech LA. *Am J Kidney Dis.* 2007 Jul;50(1):108-18, 118.e1-4. doi: 10.1053/j.ajkd.2007.04.020. PMID: 17591530 Free PMC article. Clinical Trial.
3. Relationship between volume status and blood pressure during chronic hemodialysis
4. Leypoldt JK, Cheung AK, Delmez JA, Gassman JJ, Levin NW, Lewis JA, Lewis JL, Rocco MV. *Kidney Int.* 2002 Jan;61(1):266-75. doi: 10.1046/j.1523-1755.2002.00099.x. PMID: 11786109
5. Association of all-cause mortality with predialysis systolic blood pressure and its peridialytic change in chronic hemodialysis patients
6. Zhang H, Preciado P, Wang Y, Meyring-Wosten A, Raimann JG, Kooman JP, van der Sande FM, Usvyat LA, Maddux D, Maddux FW, Kotanko P. *Nephrol Dial Transplant.* 2020 Sep 1;35(9):1602-1608. doi: 10.1093/ndt/gtz289. PMID: 32003794 Free PMC article.