SUPPLEMENTARY DATA

Relationship Between Percentage of Interdialytic Weight Gain and Diastolic Blood Pressure Parameters

In bivariate analyses, every 1% increase in interdialytic weight gain (IDWG; as an independent variable) was associated with a significant increase in predialysis diastolic blood pressure (DBP; parameter estimate [PE], 0.45 mm Hg; 95% confidence interval [CI], 0.31 to 0.60; $P < 0.0001$; Table 1A), decreasing postdialysis DBP (PE, −0.14 mm Hg; 95% CI, 0.02 to 0.26; $P = 0.03$), and thus a greater change in (Δ)DBP (PE, 0.62 mm Hg; 95% CI, 0.46 to 0.78; $P < 0.0001$; Table 2A). The magnitude of the relationship between IDWG and DBP was most pronounced for ΔDBP; for example, every 1% increase in IDWG was associated with a decrease in DBP from predialysis to postdialysis of 0.62 mm Hg.

Associations Between Clinical Parameters and Predialysis DBP

In bivariate analyses, variables other than percentage of IDWG that were significant predictors of increasing predialysis DBP included greater dry weight, black race, male sex, history of left ventricular hypertrophy, Hispanic ethnicity, and history of hypertension. Variables associated with lower predialysis DBP included increasing age and history of peripheral vascular disease, coronary artery disease, arrhythmia, chronic obstructive pulmonary disease, and diabetes mellitus (Table 1A).

Table 1A. Bivariate and Multivariable Predictors of Predialysis Diastolic Blood Pressure in Prevalent Hemodialysis Patients

Variable	Bivariate Slope Parameter Estimate (mm Hg)	*P*	Multivariable Slope Parameter Estimate (mm Hg)	*P*
%IDWG (/1% increase)	0.45 ± 0.14	<0.0001	0.46 ± 0.15	<0.0001
Dry weight (/1 kg increase)	0.15 ± 0.07	<0.0001	0.10 ± 0.07	0.006
Black race (*v* nonblack)	5.9 ± 2.0	<0.0001	3.7 ± 2.2	0.001
Male sex (*v* female)	4.0 ± 1.9	0.0001	2.2 ± 2.0	0.03
Left ventricular hypertrophy	2.9 ± 2.1	0.006	3.5 ± 1.8	0.0002
Hispanic ethnicity	5.0 ± 3.2	0.002	6.6 ± 3.4	0.0002
Hypertension	6.0 ± 3.5	0.001	4.9 ± 3.3	0.004
Tobacco use *v* nonuse	1.85 ± 2.2	0.1*		Not significant
Creatinine	−0.13 ± 0.26	0.4	−0.27 ± 0.28	0.06
Age (/1 y increase)	−0.32 ± 0.07	<0.0001	−0.24 ± 0.08	<0.0001
Peripheral vascular disease	−5.2 ± 2.3	<0.0001	−2.9 ± 2.4	0.02
Coronary artery disease	−4.2 ± 2.2	0.0002*		Not significant
Arrhythmia	−5.0 ± 3.0	0.001	−2.4 ± 2.7	0.09
Chronic obstructive pulmonary disease	−4.9 ± 3.1	0.002*		Not significant
DM as cause of ESRD	−1.2 ± 2.1	0.28	0.03 ± 2.8	0.9
DM	−2.4 ± 2.0	0.02	−3.0 ± 2.7	0.03
Cerebrovascular disease	−2.8 ± 2.5	0.03*		Not significant
Treatment group	−0.17 ± 2.2	0.9	0.65 ± 1.8	0.5
Interaction terms				
%IDWG * DM as cause ESRD				0.02
%IDWG * creatinine				0.01
%IDWG * age				0.005
%IDWG * dry weight				0.4
%IDWG * black race				0.6

Note: Values expressed as number ± 95% confidence interval. Nonsignificant predictors of DBP in bivariate analyses included duration of dialysis therapy; antihypertensive class (angiotensin-converting enzyme inhibitor, β-blocker, calcium channel blocker), history of bilateral nephrectomy or congestive heart disease, serum albumin level, erythropoietin use, or history of medical noncompliance. Because of missing data, 406 patients and 28,721 dialysis sessions are included in this model.

Abbreviations: %IDWG, percentage of interdialytic weight gain; DM, diabetes mellitus; ESRD, end-stage renal disease.

*Removed from the final multivariate model with $P > 0.10$. Treatment group, DM as cause of ESRD, and age were forced into the final models.

Table 2A. Bivariate and Multivariable Predictors of ΔDBP in Prevalent Hemodialysis Patients

Variable	Bivariate Slope Parameter Estimate (mm Hg)	*P*	Multivariable Slope Parameter Estimate (mm Hg)	*P*
IDWG (/1% increase)	0.62 ± 0.16	<0.0001	0.31 ± 0.12	<0.0001
Predialysis DBP (/1 mm Hg increase)	0.77 ± 0.02	<0.0001	0.77 ± 0.02	<0.0001
Hispanic ethnicity	7.0 ± 4.0	0.0006	*	Not significant
Left ventricular hypertrophy	2.2 ± 1.4	0.002	*	Not significant
Creatinine (/1 mg/dL increase)	0.18 ± 0.15	0.02	0.24 ± 0.22	0.02
DM as cause of ESRD	1.5 ± 1.6	0.07	2.9 ± 1.6	0.0003
DM	0.38 ± 1.4	0.6	*	Not significant
Black race (*v* nonblack)	1.30 ± 1.5	0.09	−3.2 ± 1.6	0.0002
Dry weight (/1 kg increase)	0.03 ± 0.04	0.10	−0.05 ± 0.04	0.01
Age (/1 y increase)	−0.12 ± 0.05	<0.0001	0.12 ± 0.05	<0.0001
Duration of dialysis, prevalent *v* incident (≥1 *v* <1 y)	−1.44 ± 1.45	0.05	*	Not significant
Coronary artery disease	−1.4 ± 1.5	0.07	*	Not significant
Treatment group	0.71 ± 1.4	0.3	0.31 ± 1.4	0.7
Interaction terms				
%IDWG * age				0.03
%IDWG * dry weight				0.3
%IDWG * DM as cause of ESRD				0.4
%IDWG * predialysis DBP				0.9
%IDWG * black race				0.3
%IDWG serum creatinine				0.5

Note: Values expressed as number ± 95% confidence interval. Nonsignificant predictors of ΔDBP in univariate analyses included sex; tobacco use; antihypertensive class (angiotensin-converting enzyme inhibitor, β-blocker, calcium channel blocker); history of bilateral nephrectomy, arrhythmia, chronic obstructive pulmonary disease, congestive heart disease, cerebrovascular disease, hypertension, or peripheral vascular disease; erythropoietin use; serum albumin level; or history of medical noncompliance. Because of missing data, 418 patients and 29,369 dialysis sessions patients are included in this model.

Abbreviations: IDWG, interdialytic weight gain; DBP, diastolic blood pressure; ESRD, end-stage renal disease; DM, diabetes mellitus.

*Removed from the final multivariate model with $P > 0.10$. Treatment group, DM as cause of ESRD, and age were forced into the final models.

In multivariable analyses, every 1% increase in percentage of IDWG was associated with a 0.46 mm Hg increase in predialysis DBP. Other significant predictors of increased predialysis DBP included increasing dry weight, black race, male sex, history of left ventricular hypertrophy, Hispanic ethnicity, and hypertension. Variables associated with decreased predialysis DBP included greater serum creatinine level, older age, peripheral vascular disease, and diabetes mellitus.

In multivariable analyses of predictors of predialysis DBP, there were significant interactions between percentage of IDWG and diabetes as cause of end-stage renal disease (ESRD; $P = 0.02$), serum creatinine level ($P = 0.01$), and age ($P = 0.005$). No interactions were present between percentage of IDWG and dry weight ($P = 0.4$) or black race ($P = 0.6$).

After stratifying based on parameters with significant interactions with percentage of IDWG, the relationship between percentage of IDWG and DBP clearly was modified by clinical parameters (Table 3A). For example, in patients with diabetes as cause of ESRD, the association of increased percentage of IDWG with predialysis DBP was nonsignificant compared with subjects with ESRD from other causes. For subjects stratified by quartiles of age, subjects younger than 48 years had the largest increase in predialysis DBP with increasing percentage of IDWG, more than 3-fold that of older subjects. In addition, among

Table 3A. Effect of Percentage of IDWG on Predialysis DBP in Subgroups of Patients According to Clinical or Laboratory Characteristics

Variable	Slope Parameter Estimate for %IDWG as Predictor of DBP (mm Hg)	*P*
Cause of ESRD*		
Diabetes	0.21 ± 0.24	0.07
Other†	0.57 ± 0.18	<0.0001
Age (y)‡		
<48	0.92 ± 0.29	<0.0001
48-60	0.15 ± 0.24	0.2
61-73	0.43 ± 0.24	0.0003
>73	0.22 ± 0.26	0.08
Creatinine (mg/dL)§		
<7.3	0.31 ± 0.22	0.005
7.3-9.09	0.42 ± 0.22	0.0001
9.1-11.5	0.50 ± 0.19	<0.0001
>11.5	0.56 ± 0.27	<0.0001

Note: Values expressed as number ± 95% confidence interval.

Abbreviations: IDWG, interdialytic weight gain; DBP, diastolic blood pressure; ESRD, end-stage renal disease.

*Parameter estimates generated from a multivariable model with predialysis DBP as the dependent variable and the following predictor variables: percentage of IDWG if diabetes as cause of ESRD, percentage of IDWG if other cause of ESRD, diabetes as cause of ESRD, dry weight, black race, sex, left ventricular hypertrophy, Hispanic ethnicity, hypertension, age, peripheral vascular disease, arrhythmia, diabetes mellitus, creatinine, and treatment group.

†Includes glomerulonephritis, secondary glomerular nephritis, vasculitis, interstitial nephritis, pyelonephritis, hypertensive nephropathy, neoplasms, cystic disease, and hereditary and congenital disease.

‡Parameter estimates generated from a multivariable model with predialysis DBP as the dependent variable and the following predictor variables: percentage of IDWG if younger than 48 years, percentage of IDWG if aged 48 to 60 years, percentage of IDWG if aged 61 to 73 years, percentage of IDWG if older than 73 years, age, dry weight, black race, sex, left ventricular hypertrophy, Hispanic ethnicity, hypertension, peripheral vascular disease, arrhythmia, diabetes mellitus, diabetes as cause of ESRD, creatinine level, and treatment group.

§Parameter estimates generated from a multivariable model with predialysis DBP as the dependent variable and the following predictor variables: percentage of IDWG if creatinine level less than 7.3 mg/dL, percentage of IDWG if creatinine level 7.3 to 9.09 mg/dL, percentage of IDWG if creatinine level 9.1 to 11.5 mg/dL, percentage of IDWG if creatinine level greater than 11.5 mg/dL, creatinine level, dry weight, black race, sex, left ventricular hypertrophy, Hispanic ethnicity, hypertension, age, peripheral vascular disease, arrhythmia, diabetes mellitus, diabetes as cause of ESRD, and treatment group.

quartiles of creatinine, subjects with a creatinine level greater than 11 mg/dL (>972 μmol/L) appeared to have the greatest increase in predialysis DBP associated with increased percentage of IDWG (0.56 mm Hg increase in DBP for every 1% increase in percentage of IDWG).

Associations Between Clinical Parameters and ΔDBP

In bivariate analyses, variables other than percentage of IDWG that were significant predictors of increased ΔDBP (ie, greater decrease in DBP prehemodialysis to posthemodialysis) included greater predialysis DBP, Hispanic ethnicity, history of left ventricular hypertrophy, and greater serum creatinine level (Table 2A). Variables associated with decreased ΔDBP included increasing age and being on hemodialysis therapy longer than 1 year.

In multivariable analyses, every 1% increase in percentage of IDWG was associated with a 0.31 ± 0.12 mm Hg increase in ΔDBP with hemodialysis. Other significant predictors of increased ΔDBP included increasing predialysis DBP, increased creatinine level, diabetes as cause of ESRD, and older age. Variables associated with decreased ΔDBP included black race and greater dry weight.

Table 4A. Effect of Percentage of IDWG on ΔDBP in Subgroups of Patients Grouped by Clinical Characteristics

Variable	Slope Parameter Estimate of %IDWG as Predictor of ΔDBP (mm Hg)	*P*
Age (y)*		
<48	0.15 ± 0.22	0.2
48-60	0.35 ± 0.33	<0.002
61-72	0.35 ± 0.24	<0.005
>73	0.44 ± 0.22	<0.0001

Note: Values expressed as number ± 95% confidence interval.

Abbreviations: IDWG, interdialytic weight gain; DBP, diastolic blood pressure.

*Parameter estimates generated from a multivariable model with ΔDBP as the dependent variable and the following predictor variables: percentage of IDWG if younger than 48 years, percentage of IDWG if aged 48 to 60 years, percentage of IDWG if aged 61 to 73 years, percentage of IDWG if older than 73 years, age, predialysis DBP, serum creatinine level, diabetes as cause of end-stage renal disease, black race, dry weight, and treatment group.

In multivariable analyses of predictors of ΔDBP, there were significant interactions between percentage of IDWG and age ($P = 0.03$). There were no interactions between percentage of IDWG and dry weight ($P = 0.3$), diabetes as cause of ESRD ($P = 0.4$), predialysis DBP ($P = 0.9$), or black race ($P = 0.3$).

After stratifying based on parameters with significant interactions with percentage of IDWG, the relationship between percentage of IDWG and ΔDBP was modified by age (Table 4A). Similar to Δsystolic blood pressure, younger subjects (<48 years) had the least change in ΔDBP associated with increasing percentage of IDWG (1% increase in percentage of IDWG was associated with a 0.15 ± 0.22 mm Hg increase in ΔDBP; $P = 0.2$); the relationship between IDWG and ΔDBP was nonsignificant in this group. However, older subjects had a more pronounced change in ΔDBP associated with increasing percentage of IDWG.