



# EARLY CHANGES IN SYSTOLIC BLOOD PRESSURE AND BODY WEIGHT ARE ASSOCIATED WITH LONG TERM MORTALITY IN INCIDENT DIALYSIS PATIENTS

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## Background

Elevated systolic blood pressure (SBP) and body water content are known death risk factors. They are often observed in patients with heart and/or renal failure and are further influenced by dialysis treatment [1;2].

Important changes in SBP and body weight (BW) are expected to occur in incident dialysis patients, and these changes could significantly influence survival.

## Objectives

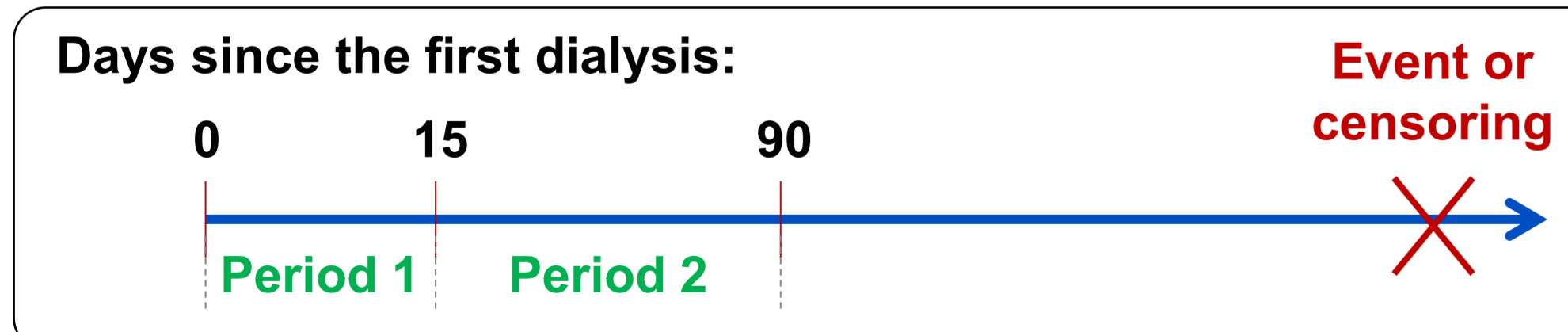
To estimate the association between early changes in SBP and BW and mortality in incident dialysis patients.

## Materials & Methods

Patients incident to dialysis in 2004-2010 in 2 centers and surviving 90 days were followed-up for maximum 8 years.

Longitudinal data (SBP and BW before dialysis) were obtained from medical records and outcome (death or treatment refusal) and comorbidities were extracted from the French REIN registry.

BP and BW changes (linear regression slopes) and mean values in periods 1 and 2 were dichotomized based on 33th percentile and associated with survival using Cox regressions adjusting on age and gender.



Data are presented as mean and standard deviation or median and interquartile range according to data distribution.

## Results

### PATIENTS DESCRIPTION

385 patients were included (table 1). Most patients (96%) were treated with hemodialysis (4% treated with hemodiafiltration).

During follow-up (median, 2.25 years), 178 (46%) patients presented the outcome.

Between period 1 and 2,

SBP changed from 145 ± 23 to 141 ± 20 mmHg,

BW changed from 71 ± 16 to 70 ± 15 kg (paired tests, p<0.001).

	Patients
Age (years)	74.5 (65.0 – 81.3)
Female (%)	36%
Initial renal disease (%)	
Glomerulonephritis	18%
Diabetic nephropathy	15%
Other etiologies	66%
Comorbidities (%)	
Hypertension	86%
Diabetes	40%
Coronary failure	37%
Arteritis lower limb	34%
Heart failure	21%
Cancer	12%
Dialysis modalities	
Weekly frequency	3.0 (3.0 – 3.0)
Dialysis duration (hr)	4.0 (3.0 – 4.0)
High flux dialyzers (%)	63%
Catheter (%)	37%

Table 1: Patient characteristics

### SBP, BW AND MORTALITY

In univariate analyses, low SBP (both periods), decreasing SBP on period 2 and decreasing BW (both periods) were associated with mortality (table 2).

In multivariate analysis, decreasing BW on both periods were significantly associated with mortality and low SBP on period 2 was borderly significant (table 2).

Table 2: Age and gender-adjusted hazard ratios of mortality

Effect (Lowest vs middle and upper tertiles)	Period	Univariate		Multivariate	
		HR and 95% CI	P-value	HR and 95% CI	P-value
SBP ≤ 135 mmHg	1	1.6 [1.1 ; 2.2]	0.01	1.1 [0.6 ; 1.8]	0.7
SBP ≤ 130 mmHg	2	1.7 [1.2 ; 2.4]	0.001	1.6 [1.0 ; 2.7]	0.06
SBP slope ≤ -3 mmHg/month	2	0.7 [0.5 ; 0.9]	0.03	0.9 [0.6 ; 1.3]	0.7
BW slope ≤ -3 kg/month	1	1.9 [1.4 ; 2.7]	<0.001	1.6 [1.2 ; 2.3]	0.006
BW slope ≤ 0 kg/month	2	2.0 [1.4 ; 2.7]	<0.001	1.8 [1.3 ; 2.7]	<0.001

### INFLUENCE OF HEART FAILURE

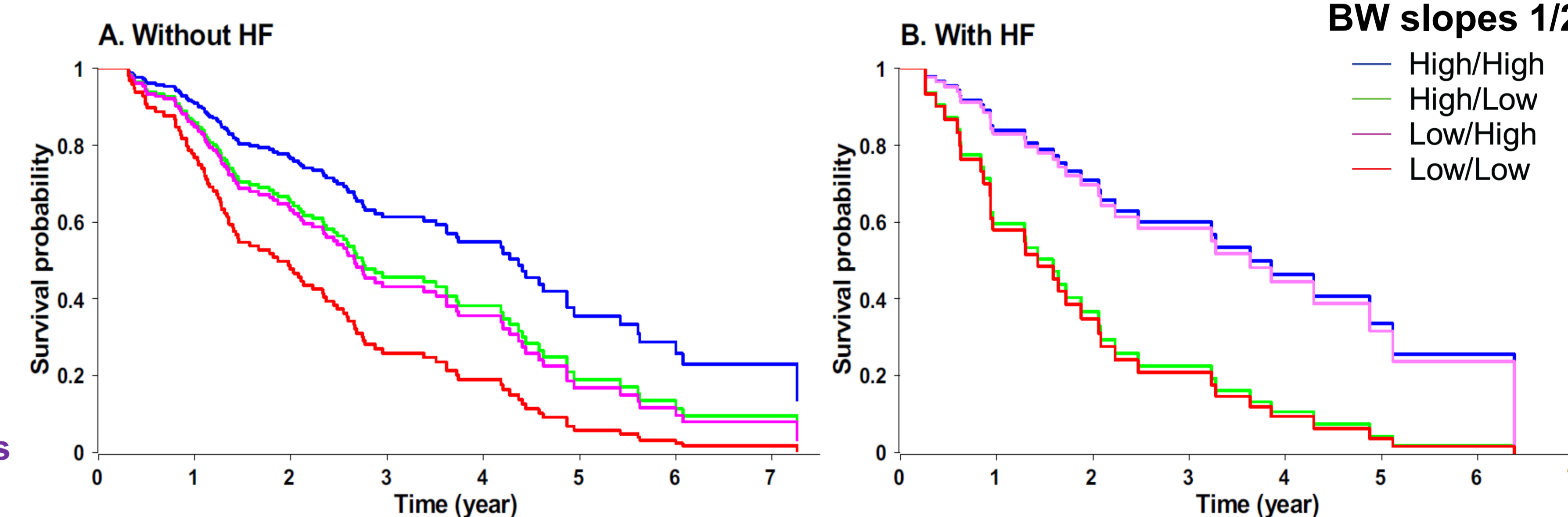
BW slopes remained significant (p<0.02) after adding heart failure (NS) in the model.

Low initial BW slope (≤ -3 kg/month) increased mortality in patients without HF, but not in those with HF (figure A and B).

Low secondary BW slope (< 0 kg/month) increased mortality in patients with or without HF (figure A and B).

Figure: Survival curves depending on HF and BW slopes

Groups are based on the 33th percentiles of BW slopes 1 and BW slope 2



## Discussion

In the first months, patients starting dialysis have significant changes in SBP and BW.

Patients with BW decrease, low SBP or increasing SBP in the first weeks on dialysis were at greater risk of mortality. In patients with heart failure, initial BW decline did not increase mortality, possibly because it represented excess water removal.

Knowing early changes in BW and SBP, with HF diagnosis, could help to estimate patient prognostic.

## References

- [1] Zager, P.G., Nikolic, J., Brown, R.H., Campbell, M.A., Hunt, W.C., Peterson, D., Van Stone, J., Levey, A., Meyer, K.B., Klag, M.J., et al. "U" curve association of blood pressure and mortality in hemodialysis patients. *Kidney Int.* 1998; 54, 561–569.
- [2] Tapolyai M, Faludi M, Réti V, Lengvárszky Z, Szarvas T, Berta K. Dialysis Patients' Fluid Overload, Antihypertensive Medications, and Obesity: *ASAIO J* 2011;57:511–5.

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