

End dialysis over-weight is associated with all-cause and cardiovascular mortality in uremic patients on regular hemodialysis treatment. A 3-year prospective observational study.

Movilli E, Camerini C, Gaggia P, Zubani R, Feller P, Poiatti P, Pola A, Carli O, Possenti S, Bregoli L, Foini P, Cancarini G.

Division of Nephrology, A.O. Spedali Civili di Brescia, and Section of Nephrology, University of Brescia, Italy.

OBJECTIVES

We hypothesize that the difference between the really attained and the prescribed end dialysis body weight, defined end-dialysis over-weight, (edOW; Kg) could impact survival in hemodialysis (HD) patients.

Aim of this prospective observational study was to evaluate if edOW could influence survival in a cohort of prevalent HD patients, controlled for multiple dialysis and clinical risk factors and followed for 3 years.

METHODS

182 patients, 117 men, age 65 ± 13 years, on regular HD treatment for at least 6 months, median 48 months (range 6-366 months) were followed from 1st January 2008 to 31st December 2010.

Eighty four patients (46%) did not achieve dBW, their median edOW was 0.4 Kg (range 0.1-1.4 Kg).

During observation 98 patients died, mainly for cardiovascular reasons (69%).

Multivariate Cox regression analysis was utilized to evaluate the effect on mortality of edOW, ultrafiltration rate (UFR), interdialytic weight gain (IDWG), age, sex, dialytic vintage, cardiovascular disease (CVD), antihypertensive therapy, diabetes, duration of HD, body weight (dBW), body mass index (BMI), mean arterial pressure (MAP), Kt/V, protein catabolic rate (PCRn).

RESULTS

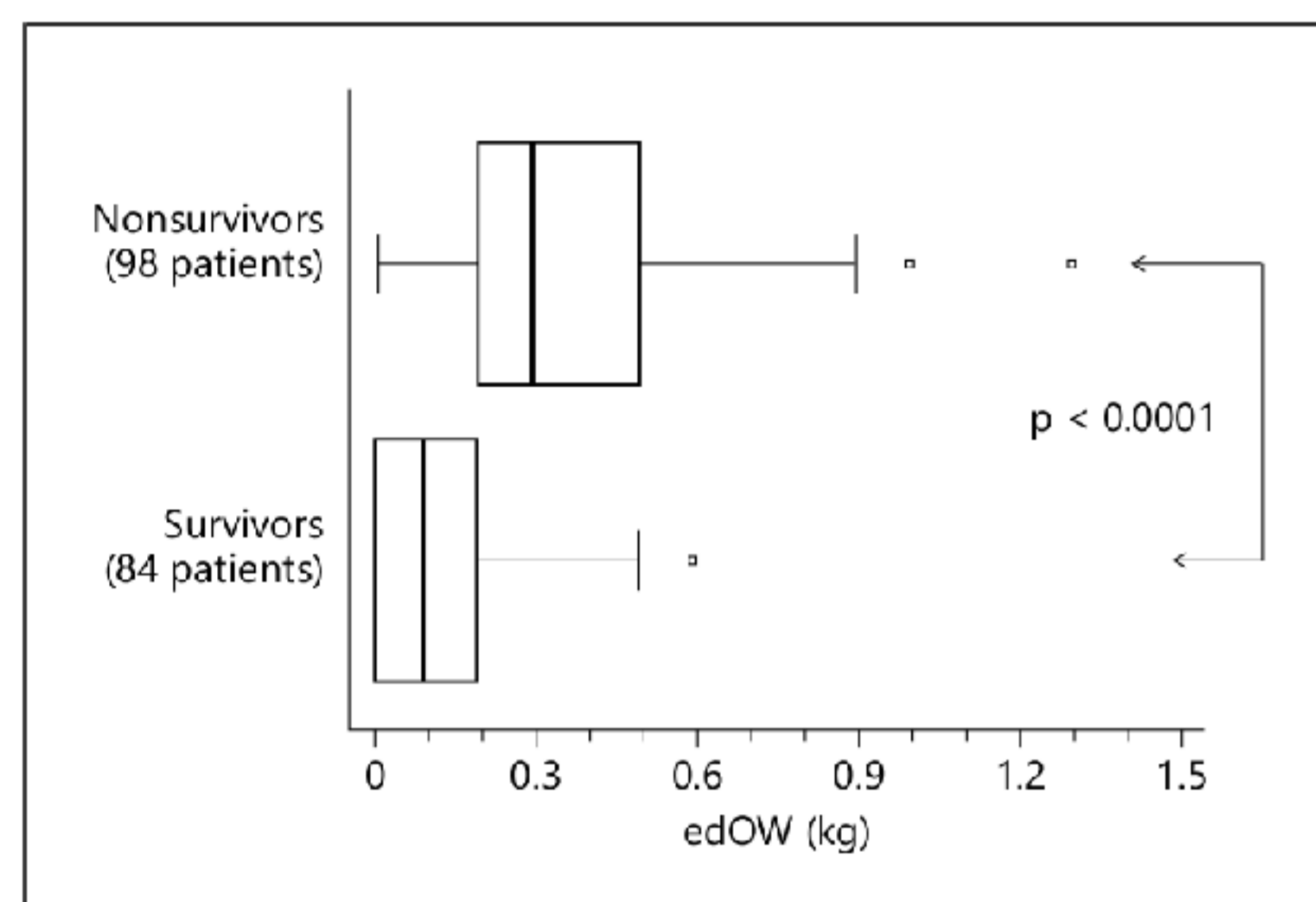


Fig. 1. Comparison of values of edOW between patients who survived and those who did not during the follow-up.

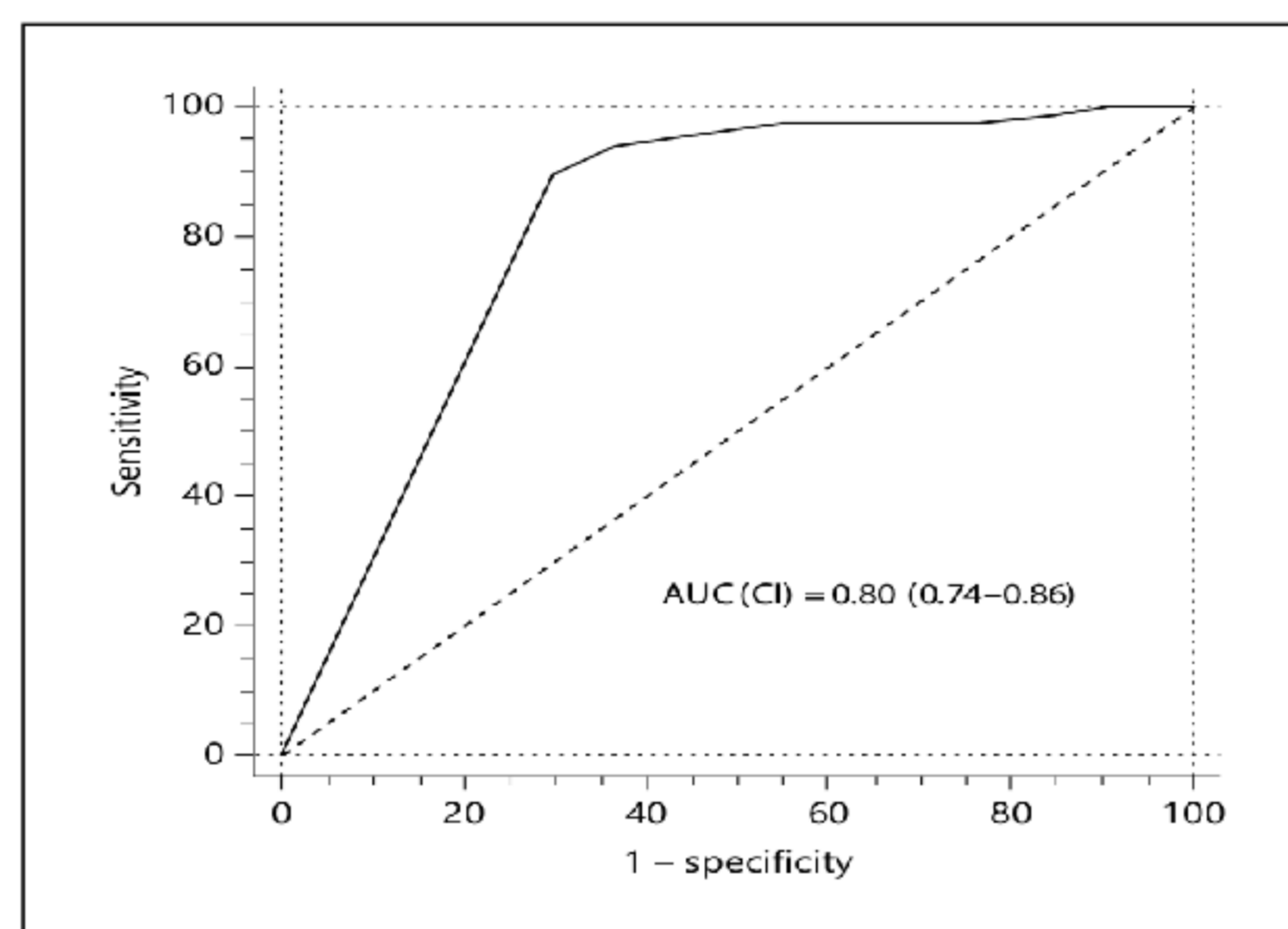


Fig. 2. ROC curve for edOW and mortality. 95% CI is reported in parentheses. AUC = area under curve.

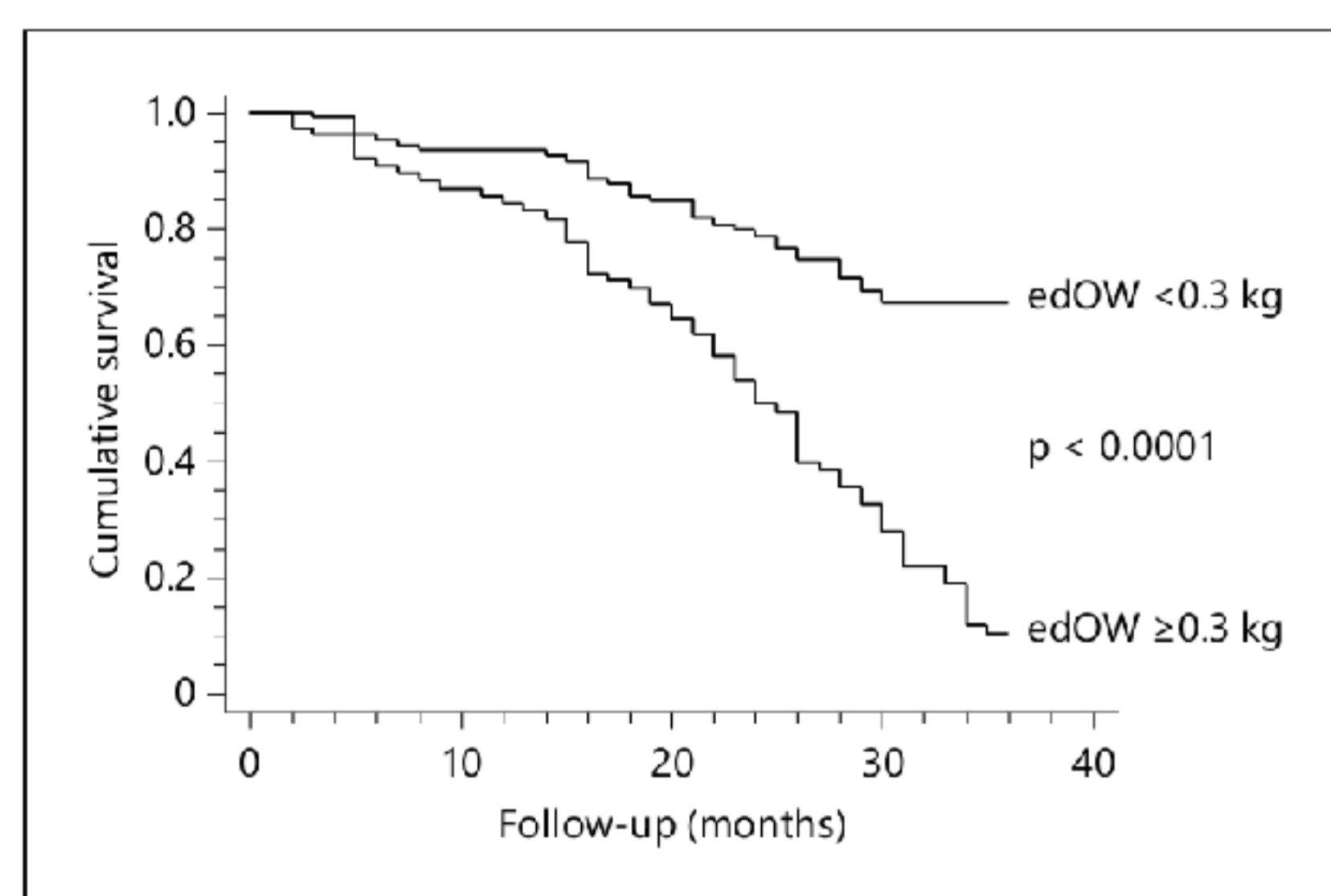


Fig. 3. edOW and all-cause mortality. Patient survival curves adjusted for significant predictors at Cox regression analysis by using edOW as a categorical variable defined according to the ROC-derived edOW threshold of 0.3 kg.

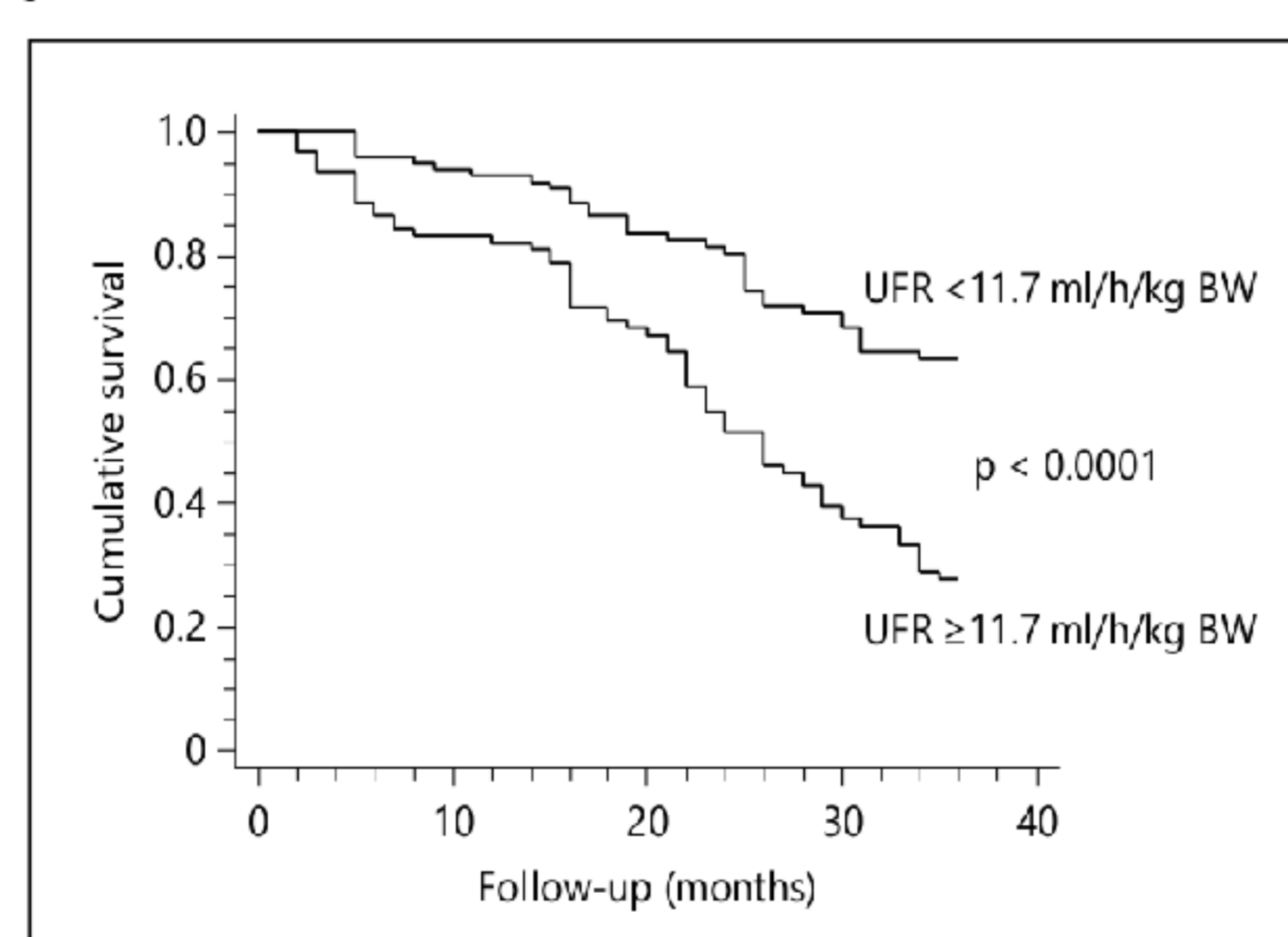


Fig. 4. UFR and all-cause mortality. Patient survival (Kaplan-Meier curve) according to the degree of UFR (ml/h/kg BW).

Fig. 1: Comparison of values of edOW between patients who survived and those who died during the follow-up.

Fig 2: The relative receiver operating characteristic (ROC) curve for edOW and mortality. The ROC curve identified a cut-off value of edOW in predicting death of **0.3 Kg**.

Fig 3: edOW and all-cause mortality (Kaplan-Meier curve). The same analysis examining edOW and cardiovascular mortality showed greater cardiovascular mortality for patients with $\text{edOW} \geq 0.3$ Kg ($p < 0.009$, data not shown).

Fig 4: UFR and all-cause mortality (Kaplan-Meier curve).

Cox proportional Hazard model:

Age (HR 1.04; CI 1.03-1.05; $p < 0.0001$),
IDWG (HR 2.62; CI 2.06-3.34; $p < 0.01$),
UFR (HR 1.13; CI 1.09-1.16; $p < 0.01$),
PCRn (HR 0.02; CI 0.01-0.04; $p < 0.001$) and
edOW (HR 2.71; CI 1.95-3.75; $p < 0.02$)

were independently correlated to survival.

CONCLUSIONS

High edOW are independently associated with an increased long-term risk of all-cause and cardiovascular mortality in HD patients.

Better survival was observed in patients with $\text{edOW} < 0.3$ Kg.

For patients with higher edOW, longer or more frequent dialysis sessions should be considered in order to prevent the deleterious consequences of excessive body fluid expansion.

REFERENCES:

- Charra B: 'Dry weight' in dialysis: the history of a concept. *Nephrol Dial Transplant* 1998;7: 1882-1885.
- Agarwal R, Weir MR: Dry-weight: a concept revisited in an effort to avoid medication-directed approaches for blood pressure control in hemodialysis patients. *Clin J Am Soc Nephrol* 2010;5:1255-1260.
- Weiner DE, Tighiouart H, Amin MG, Stark PC, MacLeod B, Griffith JL, Salem DN, Levey AS, Sarnak MJ: Chronic kidney disease as a risk factor for cardiovascular disease and all-cause mortality: a pooled analysis of community-based studies. *J Am Soc Nephrol* 2004; 15:1307-1315.
- Foley RN, Parfrey PS, Sarnak MJ: Clinical epidemiology of cardiovascular disease in chronic renal disease. *Am J Kidney Dis* 1998;32:S112-S119.
- Sarkar SR, Kotanko P, Levin NW: Interdialytic weight gain: implications in hemodialysis patients. *Semin Dial* 2006;19:429-433.

