SURVIVAL BENEFIT OF ON-LINE HAEMODIAFILTRATION OVER HIGH-FLUX HAEMODIALYSIS

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INTRODUCTION: Standard and high-flux haemodialysis (HD) form the mainstay of treatment for patients with end-stage renal disease. On-line haemodiafiltration (HDF) provides higher solute removal over a wider range of molecular weight than standard HD. The large volume of ultrafiltrate from HDF is replaced with a solution made from "on-line" ultrapure water. Historically, HDF has not been widely practiced due to lack of large outcome studies comparing HDF with HD and also the technical requirement for ultrapure water. We compared the mortality of patients treated with HDF and high-flux HD at our Renal Unit.

METHODS: We retrospectively studied all patients who started on high-flux HD or HDF between 1989 and 2005 (n=650). Patients who were transferred out or were dialysed for <3 months were excluded.
All patients had incremental dialysis and a target two-pool Kt/V urea of 1.2/session for 3x weekly dialysis. Total Kt/V was a composite of dialyser and residual renal urea clearance (KRU). KRU was measured monthly for those with residual function. Clinical freedom was allowed to switch patients from HD to HDF and vice-versa.
For each patient we calculated the proportion of dialysis sessions that had been delivered using HDF. We analysed the effect that proportion of sessions delivered as HDF had on survival using a Cox proportional hazards model. Confounding variables included were age, co-morbidities, renal disease category, residual renal function (KRU), dialysis dose (Kt/V urea) and serum albumin.

RESULTS: At HD initiation 11.5% of patients were treated with HDF, increasing to 36% at 5 years. 46.2% of patients had HDF at some point during their dialysis career. In the Cox proportion hazards model proportion of time spent on HDF, age, disease category, KRU, dialysis Kt/V and malignancy significantly predicted survival. Where 100% of dialysis sessions were delivered as HDF the hazard of death was significantly reduced to 0.65 ($p=0.044$, C.I. 0.42-0.99). This can be interpreted as meaning that a patient treated exclusively with HDF had a 35% reduction in risk of death compared to a patient on exclusively high-flux HD at any time point. Patients having only 25% of dialysis sessions delivered as HDF had a lower hazard of death than those spending 0% of sessions on HDF (in the multivariate analysis ($p<0.001$).

CONCLUSION: Our unique finding is that in a large cohort of patients, HDF strongly predicts survival compared to high-flux HD after correcting for confounding variables including co-morbidities, age, dialysis dose and residual renal function.