

HAEMODIALYSIS INDUCED MYOCARDIAL STUNNING IS ASSOCIATED WITH A REDUCED 12-MONTH SURVIVAL.

Burton JO 1, Korsheed S 1, Jefferies HJ 1, McIntyre CW 1,2. [2008]

1 Derby City General Hospital.

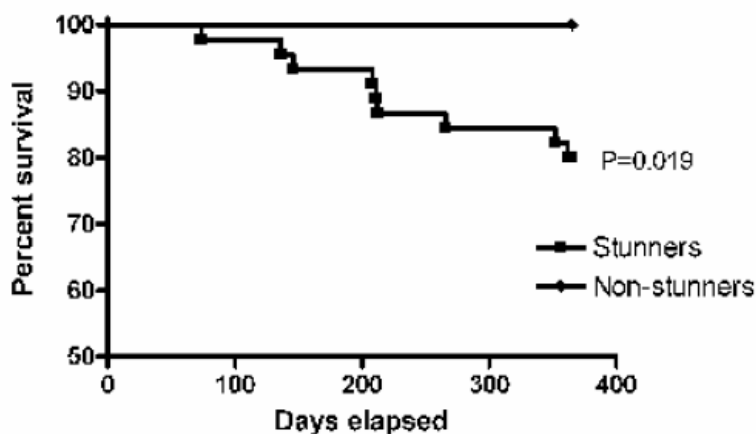
2 University of Nottingham.

Cardiovascular mortality is greatly elevated in haemodialysis (HD) patients and those with evidence of left ventricular systolic dysfunction have a particularly poor prognosis. Repetitive acute cardiac injury, as manifest by a reduction in segmental ventricular function (myocardial stunning), occurs commonly during HD. This is associated with an increase in HD associated ventricular arrhythmias, and may result in the development of heart failure. This study aimed to assess the effect of HD induced myocardial stunning on survival in prevalent HD patients.

We followed-up 70 prevalent HD patients who had been assessed for evidence of myocardial stunning using serial echocardiography (pre-dialysis, peak stress and during recovery) to assess changes in regional systolic LV function as measured by LV regional wall motion abnormalities. Significant stunning was defined as a 20% reduction in wall motion in more than 2 segments. Mortality data was collected for all patients at 12 months as well as time to first cardiovascular event (including new diagnosis of coronary artery disease, myocardial infarction, cerebrovascular and peripheral vascular events).

39% of patients showed no evidence of HD induced myocardial stunning. There were no fatalities in this group. There were 9 deaths (six cardiac disease, two sepsis, one stroke) amongst patients who did develop haemodialysis induced myocardial stunning ($P=0.019$, see figure). A composite end point of mortality and time to first cardiovascular event confirmed the association between myocardial stunning and such events, with one patient in the unaffected group, compared to 13 in the myocardial stunning group ($P=0.017$, hazards ratio of 8, 95% CI 1.264 to 10.99). Myocardial stunning is common in HD patients, and associated with a reduced 12 month survival. This process appears to be driven by potentially modifiable risk factors such as intra-dialytic hypotension and independently by ultrafiltration volume. Identification and stratification of patients at risk of myocardial stunning may allow modification of their treatment and reduce cardiovascular mortality and morbidity.

Impact of Myocardial Stunning on 1-year Mortality



Commentary by John Feehally

Research in haemodialysis has passed through a number of phases over the last 50 years. The early years were those of rapid and practical innovation as the pioneers worked out how it could be done, frequently in the basements of hospitals, as likely to be found with a screwdriver as a stethoscope. The Renal Association received no abstracts about that early work, indeed in 1959 the Executive Committee turned down a proposal for ‘a symposium on the artificial kidney’ deeming it ‘not a subject worthy of scientific study’. It was not until 1965 that the first abstract on chronic haemodialysis was presented by Stanley Shaldon [highlighted in this series in March 2010]. This is in marked contrast with the newly formed EDTA whose Congress had a strong emphasis on the science of dialysis and its consequences and complications.

There followed a period where innovation in haemodialysis was predominantly industry initiated, and most nephrologists became deliverers of dialysis service rather than intellectual pursuers of the challenges it continued to present. Then the predominant research motif became observation of performance and service improvement especially through the data emerging from the Renal Registry.

This abstract deserves our attention because it represents a vigorous return to investigator-led research responding to the challenges of the inadequacy of haemodialysis as a long term modality of renal replacement therapy. And especially studies investigating the implications of the unrelenting cardiovascular morbidity in long term dialysis patients, which has been recognised epidemiologically from the mid 1990s onwards. Could the dialysis procedure itself, as well as being life saving, carries its own contribution to the patients’ eventual demise?

The Derby group presented a series of abstracts at the Renal Association in 2007 and 2008 about myocardial stunning during haemodialysis, but I select this one as it demonstrates clearly that myocardial stunning [carefully and objectively defined] is not merely some subclinical construct, but has a major impact on outcome, being significantly correlated with increased mortality at 12 months in prevalent haemodialysis patients.

So it turns that a routine haemodialysis treatment in a stable patient can silently deliver myocardial compromise at the same time as life-sustaining correction of fluid and solute balance. A ‘two edged sword’ if ever there was one.