BETA-2-MICROGLOBULIN LEVELS IN PATIENTS TREATED WITH ON-LINE POSTDILUTION HAEMODIAFILTRATION

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Objectives:

High volume on-line postdilution haemodiafiltration (HHDF, substitution volume > 22 l/session) may help to reduce all-cause mortality in ESRD patients. The mechanisms of this survival benefit are far from clear. Circulating beta-2 microglobulin concentrations are a surrogate for middle molecular weight proteins assumed to play a role in cardiovascular mortality. Our comparative study aimed to assess the impact of different substitution volumes on pre-dialysis beta-2-microglobulin levels and mortality rates in incident HDF patients.

Methods:

The multicentre, prospective cohort study included 179 incident HDF patients. The planned follow-up was 3 years. The performance of HDF depended on center policy, all patients received routine care. Two prospectively defined subgroups of HDF patients were compared: HHDF (86 patients, substitution volume > 24l/session) and Non-HHDF (93 patients, substitution volume < 20l/session). Primary outcomes were all-cause mortality (intention to treat analysis) and associated circulating beta-2-microglobulin levels.

Table 1 Demographic characteristics at baseline in subgroups of HDF patients (Mean ± SD)

	HHDF	Non-HHDF
Number of patients	86	93
Age (years)	65 ± 8	63 ± 9
Charlson comorbidity Index	6 ± 1	6 ± 1
RRF (ml/mmin/1.73m²)	8 ± 1	9 ± 1

RRF = residual renal function; HHDF = High Volume Haemodiafiltration

Table 2 Treatment parameters during follow-up (Mean ± SD)

	HHDF	Non-HHDF
Treatment time (min/session)	252 ± 8	285 ± 12*
QB (ml/min)	361 ± 24	352 ± 35
QD (ml/min)	560 ± 35	572 ± 45
Convection volume (l/session)	26.2 ± 2.4	18.4 ± 3.1*

QB = blood flow rate, QD = dialysate flow rate; * P < 0.05

Results:

The two subgroups of HDF patients differed significantly in convection volume and treatment times, but had similar demographic (age, gender, body weight, Charlson–Comorbidity Index, baseline pretreatment beta-2-microglobulin), renal (cause of ESRD, residual renal function) and other treatment parameters (AV-fistula, blood flow rates, dialysate flow rates, Tables 1+2). There were significant differences among the subgroups in all cause mortality rate (predominantly in deaths due to cardiovascular catastrophes and infection) and in the accumulation of beta-2 microglobulin (Table 3)

Table 3: Outcome of the subgroups of HDF patients (Mean± SD, %)

	HHDF	Non-HHDF
Number of patients	62	53
ß-2-Microglobulin (mg/l)	20 ± 3*	25 ± 4
RRF (ml/min/1.73m²)	5 ± 1	5 ± 1
Mortality rate (%)	21*	34

RRF = residual renal function; * P < 0.05

Conclusions:

Within the limitations of non-randomized investigations, the present study demonstrates the survival benefit of high efficiency HDF may be related - at least in part - to the enhanced removal of middle-sized uremic toxins by high convection volumes. Pre-treatment beta-2 microglobulin levels less than 20 mg/l may be considered as a new determinant of HDF adequacy.

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