**Comparison of the FX120 haemodialyser and FX1000 haemodiafilter in post-dilution haemodiafiltration**

**INTRODUCTION:** As membrane biocompatibility has improved we have phased out the tailoring of dialyser size to patient size in adult HD patients. This has enabled us to standardise on the highest specification dialyser we can afford from the range offered by our supplier. Our present supplier, Fresenius Medical Care, recently introduced the FX120 haemodialyser. It has a surface area (SA) of 2.5 m2, an ultrafiltration coefficient (KUF) of 87 mL/hr/mmHg and fibres with a low internal diameter (ID) of 185 nm. In HD, low fibre ID enhances the ‘internal filtration’ where excess forward filtration (from the blood to dialysate) at the arterial end of the dialyser is compensated by backfiltration at the venous end, creating a process rather like post-dilution HDF. These characteristics mean the FX120 is optimised for both diffusive and convective clearance in HD and would be our standard dialyser for adult patients on HD.

However, as we currently have a mix of machines designed for HD and HDF, to standardise on the FX120 we needed to confirm that is not inferior to the FX1000 haemodiafilter (SA 2.2 m2, KUF 75 mL/hr/mmHg, ID 210 nm) when used in post-dilution HDF. In HDF, low fibre ID will lead to haemoconcentration at the arterial end of the dialyser which could compromise clearance or increase clotting.

**METHOD:** Twelve patients (11 male, age 29 to 63 years, weight 58 to 212 kg) with little or no residual kidney function who had been stable on post-dilution HDF with the FX1000 for over three months, agreed to change to the FX120 for a three month evaluation. Mid-week, pre-dialysis blood samples for B2M were taken at the start and end of the evaluation to compare middle molecule clearance. The samples were frozen so they could be tested with the same batch of reagent. For each patient, the median Kt/V and pre-dialysis potassium and phosphate levels was obtained from routine blood tests for three months with each dialyser to compare small solute clearance. The mean blood volume processed and dialyser clotting score was calculated for each patient from the dialysis session records for the month prior to the evaluation, and for the last month on the FX120. Parameters were compared using paired t-tests.

**RESULTS:** There were no significant differences in pre-dialysis B2M, potassium and phosphate following the change from the FX1000 to the FX120. The slight reduction in blood volume processed with the FX120 was due to access problems not clotted fibres. This was to be expected as patients with access problems leading to erratic blood flows when on the FX1000 were excluded from the evaluation. Despite lower processed volumes, 9 of the 12 patients had higher Kt/V with the FX120, though the overall increase was not statistically significant.

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| **Parameter** | **FX1000** | **FX120** | **p** |
| Beta-2 microglobulin (mg/L) | 28.8 ± 5.3 | 28.9 ± 5.1 | 0.95 |
| Kt/V | 1.27 ± 0.20 | 1.32 ± 0.25 | 0.16 |
| Pre-dialysis phosphate (mmol/L) | 1.76 ± 0.56 | 1.76 ± 0.49 | 0.99 |
| Pre-dialysis potassium (mmol/L) | 5.3 ± 0.5 | 5.3 ± 0.6 | 0.57 |
| Blood volume processed (L) | 90.6 ± 6.9 | 88.3 ± 8.8 | 0.10 |
| Dialyser clotting score (0 to 4) | 0.9 ± 0.5 | 1.0 ± 0.5 | 0.61 |

**DISCUSSION:** The evaluation indicated that clearance of small and middle molecules in HDF was not compromised when patients changed to the FX120, despite the smaller fibre diameter. The observed increase in Kt/V may be a real result as FX120 has a 14% larger surface area

**CONCLUSION:** This comparison confirmed that, when used in post-dilution HDF, the FX120 haemodialyser is not inferior to the FX1000 haemodiafilter. Standardising on the FX120 will minimise the difference in the treatment delivered while we are unable to offer all patients HDF, as well as simplifying stock control and the setting up of machines.