Favourable Biochemical Outcomes of Frequent Hemodialysis at Home Using the NxStage® System One™ – The European Experience

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INTRODUCTION AND AIMS: The NxStage System One (NSO) was launched in its first European market in 2009. This novel machine, which was specifically designed for the home environment, has facilitated adoption of home hemodialysis (HHD). We describe here the experience with frequent HHD, using the NSO with an optimised dialysate volume.

METHODS: This study involved retrospective data collection among 127 patients in 7 centers across 4 European countries (UK, France, Italy, and Spain).

RESULTS: Mean age was 49.6 years (SD, 13.5) and 66% were male. Mean BMI was 26.4 (range, 13-51), mean Charlson Comorbidity Score was 3.6 (range, 0-11), and leading primary renal diagnoses were glomerulonephritis (30.7%), diabetes (9.4%), and polycystic kidney disease (8.7%). Access type was distributed as 76.4% fistula, 20.5% catheter, and 3.1% graft; and 74% with a fistula used the buttonhole technique. Almost all patients dialyzed frequently, with 27.6% on 5 sessions per week and 70.1% on 6 or 7 sessions, for a mean of 14.8 hours (SD, 2.9) of treatment per week. Over 95% used between 20 and 30 L of dialysate per session.

Before initiating HHD training, 66.1% were on conventional HD, 8.7% on peritoneal dialysis, 5.5% on frequent HD, 2.4% with failed transplant; the remainder (17.3%) were incident dialysis patients. Mean and median time on dialysis before initiating HHD training was 36.9 and 15.0 months, respectively. Training time was short, with a mean of 16.9 sessions (SD, 13.9) over a mean of 4.0 weeks (SD, 3.4) to become independent at home.

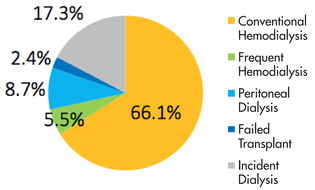
Laboratory parameters have been favourable and are displayed in the table (right). Changes in bicarbonate and potassium from baseline to 6 months were significant ($P < 0.01$). Antihypertensive agents per day decreased significantly ($P < 0.001$); the percentage of patients using no agents increased from 29% at baseline to 40% at 6 months. The percentage of patients requiring anticoagulation with heparin decreased from 75% at baseline to 59% at 6 months.

CONCLUSION: Short, frequent hemodialysis at home using the NSO has proven to be an effective therapy in this patient population, with short training times, favourable biochemical outcomes, and a reduction in medication burden.

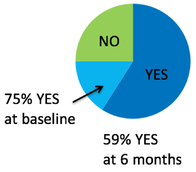
Biochemical Outcomes of 127 Patients in 7 Centers Across 4 European Countries

	Baseline Mean (SD)	3 Months Mean (SD)	6 Months Mean (SD)
Weekly Standardized Kt/V	2.57 (0.64)	2.65 (0.48)	2.69 (0.55)
Beta-2-microglobulin (mg/L)	23.6 (9.0)	26.6 (11.7)	25.5 (10.3)
Bicarbonate (mmol/L)	23.2 (3.5)	24.0 (3.0)	24.0 (2.9)
Potassium (mmol/L)	4.81 (0.64)	4.64 (0.70)	4.61 (0.78)
Albumin (g/L)	37.1 (5.3)	37.6 (4.2)	37.9 (7.6)
Calcium (mmol/L)	2.29 (0.19)	2.30 (0.20)	2.28 (0.19)
Phosphate (mmol/L)	1.72 (0.49)	1.68 (0.49)	1.71 (0.49)
Hemoglobin (g/dL)	11.3 (1.5)	11.1 (1.6)	11.1 (1.4)
ESAs (EPO units per week)	8,795	8,260	8,373
Antihypertensive Agents	1.49	1.15	1.02
Phosphate Binders (pills per day)	3.17	3.10	3.24

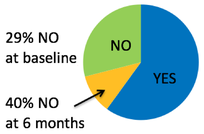
Renal Replacement Modality Before Therapy Initiation



Heparin



Antihypertensive Agents



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