

ONLINE HAEMODIAFILTRATION: DIALYSIS QUALITY IMPROVEMENT

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OBJECTIVES

Haemodialysis (HD) treatment had over many years improved the survival rate of patients with end-stage renal disease (ESRD). However, conventional HD prescription has high rates of morbidity and mortality with poor quality of life. Online haemodiafiltration (HDF) offers the most physiologic clearance profile for a broad size range of toxic molecules together with better haemodynamic stability. Our aim was to investigate, in a prospective randomized study, the effect of online HDF on dialysis clinical and biochemical outcomes and patient's quality of life.

RESULTS

Patients treated with online haemodiafiltration using post-dilution fluid replacement for 24 months had a significant improvement when compared with the control group treated with conventional HD. The major improvements were in:

- (1) Patients' clinical condition.
- (2) Biochemical outcomes.
- (3) Quality of life & patient's satisfaction level.

These results are shown in this table.

METHODS

Seventy two patients, with 58% males and mean age of 54 ± 12 year, had similar comorbidities, AV Fistula rate (80%), blood flow rate (324 ± 30 ml/min), dialysis adequacy (0.94 ± 0.08), biochemical results and duration on HD (51 ± 3 months). They were randomized into two groups. Group 1 ($n=36$) was maintained on conventional HD and group 2 ($n=36$) treated by online HDF and both were followed up for 24 months. Prescription of HD and HDF included similar 4h dialysis duration performed 3 times/week using high-flux dialysers. The reverse osmosis treated water that was used for both groups contained <0.1 CFU/ml and <0.01 endotoxin unit/ml. Group 2 received an average of 18.9 ± 2.4 L/4h as post-dilution replacement fluid. Assessment was based on clinical, laboratory and patient's questionnaire survey outcomes. The scoring system of the questionnaires ranged from 0-10. Statistical analysis was performed using Medcalc software version 10.4.0.

| Parameter | Online HDF | HD Control | P Value |
|-----------------------------|-----------------|-----------------|-----------|
| Systolic BP (mmHg) | 106 ± 5.4 | 112.7 ± 9.5 | <0.0002 |
| Hypotension during dialysis | 93 ± 7 | 39 ± 12 | <0.0001 |
| Cramps | 99 ± 13 | 26 ± 12 | <0.0001 |
| Itching | 51 ± 26 | 12 ± 4 | <0.0001 |
| Skin colour | 22 ± 21 | 10 ± 1 | <0.0001 |
| Kt/V | 1.26 ± 0.15 | 0.94 ± 0.12 | <0.0001 |
| Phosphorus (mg/dl) | 4.5 ± 0.4 | 4.6 ± 1.5 | <0.035 |
| PTH (pg/ml) | 386 ± 143 | 532 ± 281 | <0.015 |
| Albumin (g/dl) | 3.6 ± 0.35 | 3.3 ± 0.37 | <0.0001 |
| Hb (g/dl) | 10.3 ± 0.5 | 9.9 ± 0.7 | <0.01 |
| Beta 2-M (mg/l) | 22.4 ± 3.8 | 36.6 ± 8.7 | <0.0001 |
| Fatigue (general) | 95 ± 7 | 29 ± 9 | <0.0001 |
| Fatigue (post dialysis) | 91 ± 9 | 19 ± 4 | <0.0001 |
| Compliance | 82 ± 10 | 14 ± 8 | <0.0001 |
| Body energy | 79 ± 17 | 13 ± 17 | <0.0001 |
| General mood | 88 ± 14 | 10 ± 3 | <0.0001 |
| Appetite | 39 ± 16 | 10 ± 2 | <0.0001 |
| Taste | 71 ± 19 | 10 ± 5 | <0.0001 |
| Social activity | 82 ± 9 | 15 ± 8 | <0.0001 |
| Sport activity | 65 ± 14 | 10 ± 3 | <0.0001 |
| Professional activity | 81 ± 7 | 10 ± 4 | <0.0001 |

CONCLUSIONS

In conclusion, our results show that online HDF treatment was associated with significant improvement in clinical outcomes, dialysis adequacy, biochemical results and quality of life of ESRD dialysis-treated patients.

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