Ecodialysis: is it possible to design an eco-friendly system?

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Piet Mondrian, Molen: The Winkel Mill in Sunlight, 1908
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ABSTRACTS

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SO011
THE PRO-PKD SCORE, A NEW ALGORITHM TO PREDICT RENAL OUTCOME IN AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE (ADPKD) **Emilie Cornec-Le Gall**, Brest, France

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MO028
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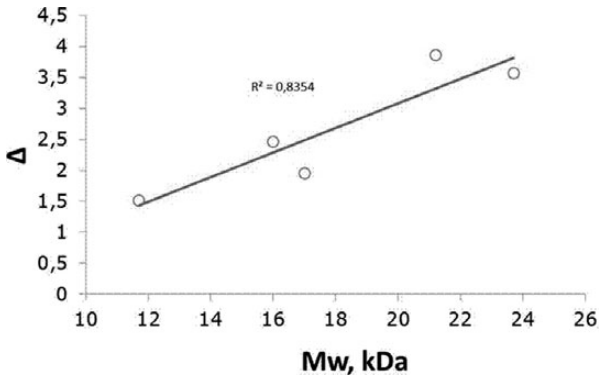
Results: The data of 94 (48 from group A and 46 from group B) patients (53M and 41F) were fully analysed. The median age was 70 (27-92) years and dialysis vintage was 47,2 (7,5÷454,6) months. No difference was found in the demographic characteristics and treatment parameters. 164 MID sessions and 161 POST sessions were analysed. A statistically significant difference in RR (%) was found for three MMW molecules: β-2 Microglobulin (β2M), Complement Factor D (CFD) and Retinol Binding protein (RBP). Values were 80,1±0,4 in POST vs 81,6±0,4 in MID (p=0,01) for β2M; 72,8±0,8 in POST vs 76,4±0,6 in MID (p=0,0003) for CFD and 24,1±0,9 in POST vs 30,0±0,8 in MID (p=0,003) for RBPThe other investigated molecules, ADMA, Homocystein, Leptin and Myoglobin, shown a better MID RR but it is not statistically significant.The reinfused volume was significantly higher in MID than in POST (average total volume of 43,63 L in MID vs 20,96 L in POST), but also the amount of reinfused volume in MID exchanged in its post dilution stage (estimated around the 2/3 as shown in Maduell publication) is significantly higher (28,8 L in MID vs 20,96 L in POST); this could explain the depuration capability of MID respect POST for the MMW molecules, indeed, was found a linear correlation (R2 0.83) between the delta differences in RR (RR Mid - RR Post) and MW of molecules (Figure 1). No significant differences between MID - and POST-dilution were observed for small MW molecules depuration (assessed by second generation daugirdas Kt/vd), neither for Albumin loss.
Conclusions: MID is superior to remove MMW molecules as compared to POST. This very likely can be related to an higher total amount and efficiency of substituted volume obtained in the MID group as compared to the POST group.



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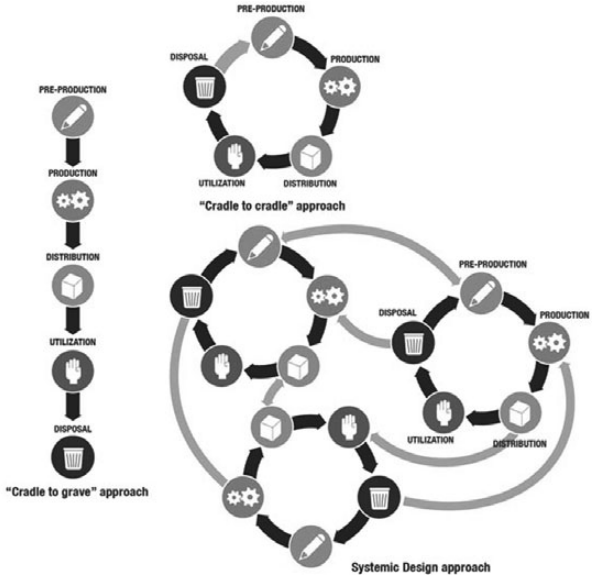
SP413 ECODIALYSIS: IS IT POSSIBLE TO DESIGN AN ECO-FRIENDLY SYSTEM?

Martina Ferraresi[1], Amina Pereno[2], Marta Nazha[1], Silvia Barbero[2] and Giorgina B Piccoli[1]
[1]University of Torino, Turin, Italy, [2]Politecnico of Turin, Turin, Italy

Introduction and Aims: Attention to the environmental impact is still limited in medicine. Chronic Hemodialysis produces about 600000 tons of plastic wastes per year. The economic crisis and the awareness of the ecosystem induced to focus attention on the lifespan of disposables,"from cradle to grave". A new outlook is presently focussed on recycle, that is the subsequent start of new cycles leading to a "from cradle to cradle" model: a "new life" for the waste products (Fig 1). Aim of the study is an analysis of the disposables employed in chronic hemodialysis, for identifying strategies limiting the environmental impact and containing the costs.
Methods: An analysis of the disposables employed on dialysis and of their "final destiny" (the grave) was performed in 3 subsequent bicarbonate dialysis sessions with 3 different dialysis machines. All disposables and packagings were photographed, classified, weighted and analyzed as for type of materials, possibility to recycle, contamination with blood or biological fluids.
Results: Each dialysis session produces between 4 and 6 kg of wastes; it may be divided into about 2 Kg of residual fluids (to be discharged); 2 Kg of "contaminated" wastes (i.e. in contact with blood or fluids) and 2 kg of "non contaminated" wastes. The differentiation is crucial, as the weight of contaminated waste products is the main determinant of disposal cost (approximately 2 Euro/kg in Italy). Furthermore, each dialysis session produces between 0.9 and 1.4 kg of packaging (cardboard and plastic); this is usually discharged separately, but where this procedure is not followed, it adds considerably to the volume and weight of the final wastes.Therefore, a undifferentiated waste collection may produce over 6 kg of waste products per session; the cost (up to 12-14 Euros) corresponds to 20-40% of the cost of the disposables. While all the cardboard and paper wastes are readily recyclable, the plastic wastes (non contaminated) can theoretically enter a dedicated recycle process. In this regard, the wastes may be classified into "families" of different plastic materials, with different compatibility for joint recycling. However, in most of the cases the types of plastic components are not identifiable and separable.Further problems are related with:-Packaging oversize: the content of most of the packaging of dialysis materials occupies between 50 and 75% of the space, increasing costs (production, wastes,



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transportation).-Emptying: there are no automated systems for emptying residual fluids after the dialysis session.-Difficult separation of materials: many packages are laminated made of different components.-Difficult separation of contaminated material: there is no clear definition of "contaminated".
Conclusions: Attention to the life cycle of the dialysis disposables may conjugate the attention to our planet, reducing the "mountain" of wastes produced every year; simple tasks, as careful emptying and differentiating between "contaminated" and "non contaminated" wastes may lead to a 20% saving of the costs of a dialysis session. Cooperation with the Industry is needed for designing recycling strategies in keeping with the modern "cradle to cradle" approach.

SP414 SURFACE, A PARAMETER TO CONSIDER IN HIGH CONVECTION VOLUME HDF

Alain Ficheux[1], Nathalie Gayrard[1], Flore Duranton[1], Caroline Guzman[1], Ilan Szwarc[2], Johanna Bismuth -Mondolfo[2], Philippe Brunet[3], Marie Françoise Servel[2] and Angel Argilés[1,2]
[1]RD – Néphrologie and Université Montpellier 1, EA7288, Montpellier, France, [2]Néphrologie Dialyse St Guilhem, Centre de Dialyse de Sète, Sète, France, [3]Service de Néphrologie, Hôpital de La Conception – Université Aix-Marseille, Marseille, France

Introduction and Aims: Convection volume seems to be crucial to the survival benefits proposed for HDF. However, high convection requires increasing transmembrane pressure (TMP) which in turn may change the membrane's behaviour and dialyser's performances.We wanted to characterise the influence of membrane surface area on the physics and on the removal performances of high convection volume on-line post-dilutional HDF.
Methods: Twelve stable dialysis patients were successively treated with Amembris® 1.8 m² and 2.3 m² dialysers, and two high convection flows, one (QUF-optimal) obtained while maintaining the dialysis setting at the maximum in vivo global ultrafiltration coefficient (GKD-UF max) and the other one at the maximum convection flow (QUF-max) limited only by the European Best Practice Guidelines (EBPG) (<30% blood flow / 300 mmHg of TMP) for 1 week each. Continuous sampling of spent dialysate was performed in all dialysis sessions and total mass of urea, creatinine, and total proteins were measured. SDS-PAGE scanning of the removed proteins and ELISA measurements of β-2-microglobulin (B2M), retinol binding protein, lambda light chains of immunoglobulins, α1-antitrypsin and albumin, were performed.
Results: Increasing from QUF-optimal to QUF-max using the 1.8 m² dialyser resulted in frequent TMP alarms and only 33% of the sessions reached the prescribed convection volume. Increasing the dialyser's surface to 2.3 m² significantly decreased the number of alarms and increased the number of sessions reaching the aimed convection volume (100% at QUF-optimal and 79% at QUF-max). The total amount of urea removed was 545±43, 473±32 and 491±44,471±38 mmol/session in HDF with QUF-optimal and QUF-max respectively for the 1.8 and 2.3 m2 surface (NS). The corresponding Kt/V values were 1.77±0.05, 1.78±0.05 and 1.75±0.04, 1.75±0.05, (NS). Removal of low mol wt proteins (observed on SDS-PAGE pattern analysis) and particularly B2M did not change in the 4 different conditions (274±35, 290±35, 266±24 and 283±35 mg/session (NS)). High molecular weight proteins removal increased with convection, notably for albumin (from 386±57 to 793±158 with 1.8 m² and from 559