

HOMOCYSTEINE LOWERING EFFECT OF ADSORPTIVE DIALYSIS MEMBRANES: A MULTICENTER, RANDOMIZED, OPEN STUDY

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Background: hyperhomocysteinemia is prevalent in patients with renal failure. Previous studies have suggested that removal of uremic toxins is the main mechanism for homocysteine-lowering effect of dialysis. It is not known whether adsorptive membranes can offer a similar or greater impact over commonly used polysulfone filters.

Methods: This prospective randomized study was designed to evaluate the potential role of adsorptive membranes in providing a sustained reduction in total plasma homocysteine (tHcy) levels. After a four-week wash-out period using a cellulosic membrane, patients were randomized to either a polysulfone or a polyester-polymer-alloy (PEPA) membrane for eight weeks. tHcy levels as well as serum folate concentrations and other relevant parameters were measured.

Results: Fifty two patients were included in this study. tHcy levels were highly related to folate concentrations ($r=-0.50$; $p=0.0007$). The mean intra-dialytic decrease in tHcy was similar with all membranes. At the end of the study, tHcy did not significantly differ between the two groups ($20.2 \pm 7.2 \mu\text{mol/l}$ vs 22.9 ± 7.2 , in the PEPA and polysulfone groups, respectively; $p=0.18$). Nevertheless, while mean tHcy concentration remained stable in the polysulfone group (22.6 ± 6.3 vs $22.9 \pm 7.2 \mu\text{mol/l}$; $p=0.48$), a significant decrease was observed in the PEPA group (22.7 ± 7.5 vs $20.2 \pm 7.2 \mu\text{mol/l}$; $p<0.0001$). Also, the variation in tHcy was +1.4% and -10.9% in the polysulfone and in the PEPA groups respectively ($p=0.02$).

Conclusion: Despite equivalent sieving properties and tHcy clearance, the membrane with high adsorptive capacity (PEPA) can reduce tHcy levels more efficiently at long-term compared with the commonly used polysulfone membranes.