

HEMODIALYSIS WITH MEDIUM CUT-OFF DIALYSIS MEMBRANES PREVENTS CALCIFICATION AND APOPTOSIS OF VASCULAR SMOOTH MUSCLE CELLS

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BACKGROUND:

Microinflammation and vascular calcification are common features in CKD patients and are partially caused by insufficient removal of proinflammatory cytokines with conventional dialyzers. Membranes with an extended permeability were tested in this clinical trial for the first time. We assessed the influence of the use of medium cut-off (MCO) membranes in chronic dialysis patients on *in vitro* calcification of vascular smooth muscle cells (VSMC).

METHODS:

50 patients were dialyzed with both MCO-Ci 400 (Gambro, Germany) and a HighFlux dialyzer (Revaclear 400, Gambro, Germany) for four weeks in a randomized order. Calcification was induced in human VSMC in the presence or absence of patient's serum samples. Calcification was quantified by alkaline phosphatase (ALP) and alizarin red staining (AZR) and normalized to WST-8. Apoptosis was measured by fluorescence. Calcification inhibitors Osteopontin (OPN) and Matrix Gla protein (MGP) were quantified in cell culture supernatants.

RESULTS:

In vitro calcification was significantly lower after incubation with serum of the MCO period compared to the Highflux period. MGP and OPN concentrations were higher in supernatants collected from Highflux group, while MGP and OPN levels of the cells from the MCO group were equal to healthy controls. The rate of apoptosis was 15% lower with serum during the MCO period compared to the Highflux period.

CONCLUSIONS:

We show for the first time that clinical hemodialysis with MCO membranes modulates calcification of human VSMC. *In vitro* calcification, apoptosis and expression of calcification markers are lower during dialysis with MCO. MCO dialyzers are a promising tool to modify the pro-calcifying effects of uremic serum. The impact on clinical endpoints needs to be investigated.

