High-dose steroid treatment increases free water transport in peritoneal dialysis patients

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Resumen

The water channel aquaporin-1 (AQP1) is the molecular counterpart of the ultrasmall pore that mediates free water transport during peritoneal dialysis (PD). Proof-of-principle studies performed in rats have shown that treatment with corticosteroids upregulates the expression of AQP1 in the peritoneal capillaries, causing a significant increase in free water transport. Whether such a beneficial effect could be observed in end-stage renal disease patients treated by PD remains unknown. Peritoneal transport parameters were evaluated in three patients on PD, shortly before and after living-donor renal transplantation and treatment with high-dose methylprednisolone (1.0-1.2 g/m2). As compared with pre-transplantation values, the post-transplantation test revealed an ~2-fold increase in the sodium sieving and ultrasmall pore ultrafiltration volume, suggesting an effect on AQP1 water channels. In contrast, there was no change in the parameters of small solute transport. The direct involvement of AQP1 in these changes is suggested by the expression of glucocorticoid receptors in the human peritoneum and the presence of conserved glucocorticoid response elements in the promoter of the human AQP1 gene.

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