The Impact of Renal Transplantation on Microbiota Derived Uremic Retention Solutes

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INTRODUCTION AND OBJECTIVES

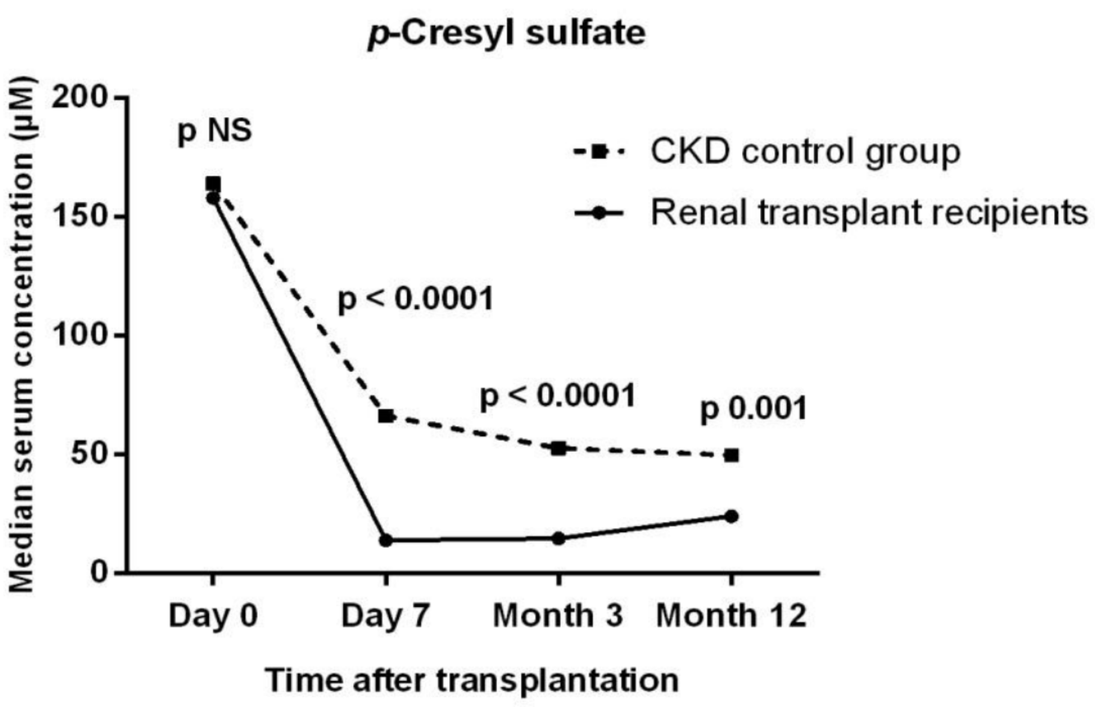
The gut microbial metabolism contributes substantially to uremic retention solutes accumulating in chronic kidney disease (CKD). Both *p*-cresyl sulfate and indoxyl sulfate are representatives of this group of solutes and associate with adverse outcomes in patients with renal dysfunction. Although it can be expected that serum levels of these microbial metabolites will decrease following renal transplantation, this has not been studied to date. In addition, whether serum levels of *p*-cresyl sulfate and indoxyl sulfate in renal transplant recipients are quantitatively different when compared to regular CKD patients is unknown.

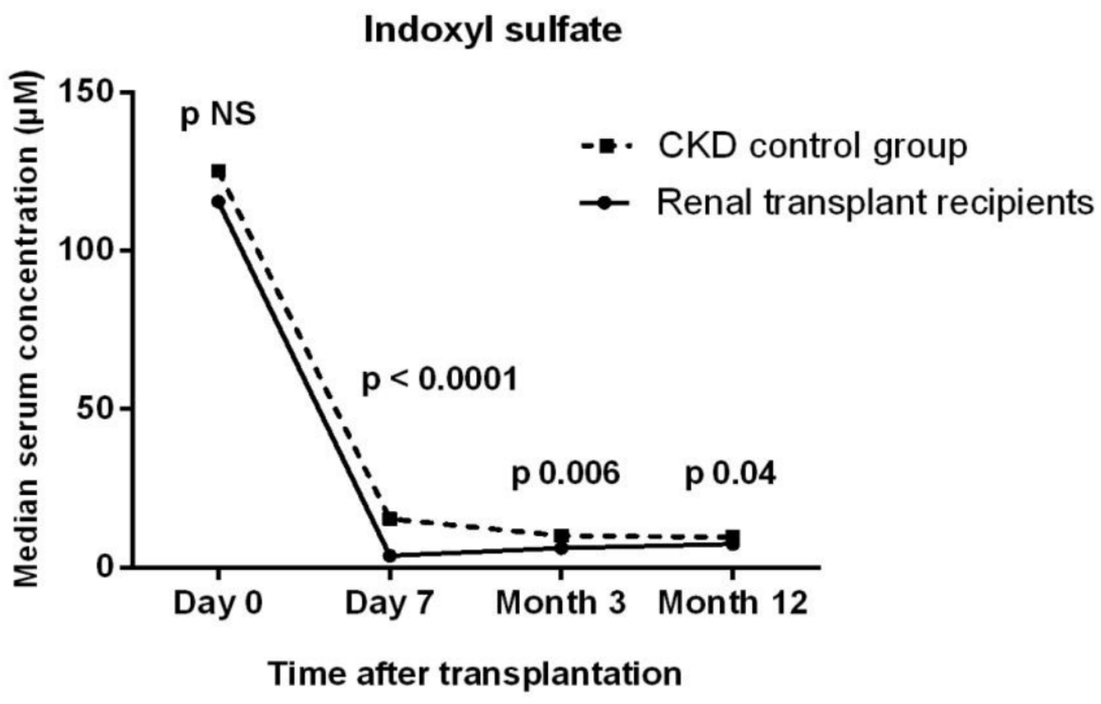
METHODS

A cohort of 51 CKD patients was prospectively followed from time of transplantation to 12 months post renal transplantation. Serum levels of *p*-cresyl sulfate and indoxyl sulfate were determined at time of transplantation, day 7, month 3 and month 12 post transplantation. At each time point, serum levels of both solutes were compared with an unrelated group of CKD patients matched for age, gender, body mass index, presence of diabetes, dialysis modality/vintage at time of transplantation or renal function (serum creatinine, eGFR and measured creatinine clearance) at other time points, and biochemistry (hemoglobin, albumin).

RESULTS

Serum levels of *p*-cresyl sulfate and indoxyl sulfate substantially decreased after renal transplantation ($P < 0.0001$ for both solutes at each time point vs. time of transplantation). When compared to CKD control patients, serum levels of both solutes were still significantly lower in renal allograft recipients at each time point (see Figure). Additional analyses demonstrated lower urinary excretion rates of microbial metabolites in renal transplant patients ($P < 0.0001$).





CONCLUSIONS

Microbiota derived uremic retention solutes substantially decrease following renal transplantation. In addition, serum levels of these solutes are significantly lower when compared to regular CKD patients, suggesting an independent influence of renal transplantation or immunosuppressive drug therapy on the gut microbial metabolism. Whether these microbial metabolites are also associated with graft dysfunction and adverse outcomes in renal transplant recipients needs further investigation.

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