

[FG062] A URINARY METABOLITE CONSTELLATION TO DETECT ACUTE REJECTION IN KIDNEY ALLOGRAFTS

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BACKGROUND

Post-transplant surveillance for acute rejection is mainly based on regular monitoring of serum creatinine levels and transplant biopsies upon functional renal impairment. Recently, we developed a novel method to detect kidney allograft rejection via a characteristic constellation of the urine metabolites alanine, citrate, lactate, and urea investigated by nuclear magnetic resonance (NMR) spectroscopy (Banas M et al. *Metabolomics* 2018).

METHODS

Within the prospective, observational UMBRELLA study 986 urine specimens were collected from 109 consecutively enrolled renal transplant recipients and metabolite constellations were analyzed by NMR spectroscopy. A metabolite rejection score was calculated and compared to histopathological results of corresponding allograft biopsies (n=206).

RESULTS

The metabolite constellation was found to be a useful biomarker to non-invasively detect acute allograft rejection (AUC = 0.75; 95% confidence interval (CI) 0.68 to 0.83; based on 46 cases with biopsy-proven rejection and 520 controls). A combination of the metabolite rejection score and the estimated glomerular filtration rate (eGFR) at the time of urine sampling further improved the overall test performance significantly (AUC = 0.84; 95% CI 0.76 to 0.91; based on 42 cases and 468 controls). In a subgroup of patients without rejection episodes the test results remained well below a diagnostic threshold associated with high risk of acute rejection. In other cases a marked increase above this threshold indicated an acute allograft rejection already 6-10 days before diagnostic renal biopsies were performed.

CONCLUSIONS

In conclusion, a combination of a NMR-based urine metabolite analysis and glomerular filtration rate is promising as a non-invasive test for post-transplant surveillance and to support decision making whether renal allografts need histopathological evaluation.