C-Terminal Agrin Fragment - A New Fast Biomarker for Kidney Function in Renal Transplant Recipients

Abstract:
Background: The C-terminal agrin fragment (CAF) is a cleavage product of agrin, the major proteoglycan of the glomerular basement membrane. This article studies if CAF could serve as a biomarker for renal function in renal transplant recipients. Material and Methods: We measured serum CAF and creatinine concentrations and calculated estimated glomerular filtration rate (eGFR) (MDRD) in 96 healthy individuals and in 110 end-stage renal disease patients undergoing kidney transplantation before and after transplantation. Correlation between CAF and creatinine concentrations/eGFR was calculated as within-patient (cWP) and between-patient correlations (cBP). Moreover, we evaluated the association of CAF with delayed graft function (DGF). The diagnostic value of CAF for early detection of DGF compared to creatinine was evaluated by receiver operating characteristics (ROC) analysis. Results: CAF concentrations strongly correlated with creatinine ($r = 0.86$ (cWP), $r = 0.74$ (cBP)) and eGFR (MDRD) ($r = 0.86$ (cWP), $r = 0.77$ (cBP)). Pre-transplant (pre-Tx) CAF concentrations were 19-fold higher than in healthy individuals (1,115.0 (258.4-3,990.0) vs. 56.6 (20.0-109.5) pM). After transplantation, CAF decreased significantly faster than creatinine (postoperative days 1-3 (POD 1-3): 562.8 (101.6-2,113.0) pM; creatinine: pre-Tx 6.9 (3.1-15.7), POD 1-3: 6.4 (1.7-12.7) mg/dl, $p < 0.001$). Stable concentrations were reached...
1-3 months after transplantation for CAF and creatinine (CAF 145.1 (6.7-851.0) pM; creatinine 1.6 (0.7-8.0) mg/dl). CAF concentrations at POD 1-3 were significantly associated with DGF and outperformed creatinine in early detection of DGF (area under the curve (AUC) CAF 80.7% (95% CI 72.3-89.1%) vs. AUC creatinine 71.3% (95% CI 61.8-81.1%), p = 0.061). Conclusion: CAF is a promising new and fast biomarker for kidney function and may serve as a new tool for the early detection of DGF. © 2013 S. Karger AG, Basel

Stichworte:
Kidney function; Glomerular filtration rate; Creatinine; C-terminal agrin fragment; Biomarker; Transplant; Delayed graft function

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