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OSMOTIC PROPERTIES OF ERYTHROCYTES IN POST-RENAL TRANSPLANT PATIENTS TREATED WITH CALCINEURIN INHIBITORS

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Renal transplant recipients treated with calcineurin inhibitors are known to demonstrate abnormalities in the physical properties of erythrocyte membranes. The aim of the present study was to determine whether the osmotic properties of erythrocytes are altered in patients after renal transplantation treated with cyclosporin A (CsA) or tacrolimus (TAC).

Venous blood samples were collected from 31 healthy donors and from 40 renal transplant recipients with good allograft function (19 patients were treated with TAC and 21 patients with CsA). Osmotic fragility was determined by fitting the complementary error function to the haemolysis resistance curve. The time course of haemolysis in hypotonic solution (62 mM NaCl) was recorded by means of stopped-flow method and the apparent rate constant of osmotic haemolysis was calculated from the decrease in absorbance (λ = 690 nm).

CsA and TAC cause a shift of the haemolysis curve towards lower osmolarities. Statistically significant decrease in the osmotic fragility was observed both in CsA-receiving patients compared with controls (0.409 ± 0.004 vs. 0.420 ± 0.003) %NaCl and in TAC-receiving recipients (0.407 ± 0.004 vs. 0.420 ± 0.003) %NaCl. The rate of osmotic haemolysis during TAC treatment was significantly decreased (0.103 ± 0.027 vs. 0.127 ± 0.015) s^{-1}. There was a negative correlation between the rate of osmotic haemolysis and CsA (R^2 = –0.63).

These results suggest that both calcineurin inhibitors alter osmotic properties of erythrocytes towards a decreased susceptibility to hypotonic haemolysis.