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Static normothermic preservation of renal allografts using a novel non-phosphate buffered preservation solution.

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Objective

There has been renewed and growing interest in the role of normothermic preservation in transplant allografts. The aim of this study was to assess the viability and function of renal allografts under normothermic conditions using a novel non-phosphate buffered preservation solution AQIX®RS-I

Methods

Porcine kidneys were flushed at 30°C with AQIX®RS-I at 100mmhg pressure after 5-10 minutes warm ischaemic time, and stored statically at either 4°C or 30°C for 2 hours (N= 4 per group). An assessment of renal function by physiological and biochemical parameters was performed by perfusing the organs with autologous blood at 37°C, with an initial circulating serum creatinine concentration of 1000µmol/l on an isolated organ perfusion system for 6 hours.

Results

Although the hypothermic group demonstrated overall superior renal function, the normothermic stored kidneys displayed a statistically comparable acid-base balance. Furthermore renal function was still evident after 6 hours perfusion with increasing oxygen consumption, renal blood flow and reduced renal vascular resistance.
Values are mean ± SD

Functional parameters After 6 hours perfusion	**AQIX® RS-I 4ºC Storage**	**AQIX® RS-I 30ºC Storage**	**P Value**
pH	7.4 ± 0.2	7.3 ± 0.1	0.484
Bicarbonate mmol/L	21.5 ± 8.8	16.6 ± 2.63	0.484
O_2 consumption ml/min/g	50 ± 14.5	26 ± 4.4	0.02
% Creatinine fall	83 ± 12.1	54 ± 3.2	0.0286
GFR ml/min/100g	1.2 ± 1.1	0.5 ± 0.3	0.343
Total urine output ml	733 ± 230	204 ± 11	0.0286
RBF ml/min	84 ± 20.7	45 ± 8.4	0.022
RVR mmHg/ml/min	0.4 ± 0.11	0.8 ± 0.17	0.393

Conclusions

The effectiveness and versatility of AQIX®RS-I as a preservation solution under both normothermic and hypothermic conditions has been demonstrated. Renal viability was maintained after 2 hours static normothermic storage. This study provides a foundation for further analysis utilising normothermic preservation, AQIX®RS-I, and the possible elimination of hypothermic conditions.