Effect of Recombinant Human Insulin-Like Growth Factor 1 (IGF-1) on Nitric Oxide and Endothelin Levels in Rats with Acute Renal Failure (ARF)

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Data indicate that healing of proximal tubule cells and hemodynamic changes play a role in the IGF-1 enhancement of glomerular filtration rate (GFR) in rats with ARF. To assess the effects of IGF-1 on possible mediators of renal hemodynamics in ARF rats, serum nitrite, and 24 hr urine excretion of nitrite, nitrate and endothelin were measured before surgery and daily for 3 days afterwards in 4 groups of rats: ARF+IGF-1 treatment, ARF+vehicle(V) treatment, sham-operated(SO)+IGF-1, and SO+V(N=6-7 for each group). ARF was produced by clamping of both renal pedicles for 45 min. IGF-1, 50 μg/100g BW, or V was injected s.c. 3X/day starting 5 hr after surgery for a total of 10 doses. Serum creatinine and urea increased and creatinine clearance fell in all ARF vs SO rats. Serum creatinine and urea increased less($p<.05$) in ARF+IGF-1 vs ARF+V rats. Serum nitrite did not differ among the 4 groups. Urine endothelin was lower in each ARF group as compared to each SO group($p<.05$) and was not affected by IGF-1 treatment. Urine nitrite and nitrate were each lower in each group of ARF vs SO rats($p<.05$) but both urine nitrite and nitrate were greater in ARF+IGF-1 rats vs ARF+V rats($p<.05$). These latter changes occurred during the first 24 hr for nitrite and by the second 24 hr for nitrate. The data are consistent with the possibility that IGF-1 increases renal function early in the course of ARF by stimulating renal synthesis of nitric oxide.

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