TITLE: REDUCED MORBIDITY IN ACUTE RENAL FAILURE WITH HIGH AMINO ACID REGIMEN.

AUTHORS: P Singer MD, S Bursztein MD, A Segal MD, V Kvetan MD, J Askanazi MD

AFFILIATION: Department of Intensive Care, Rambam Medical Ctr, Haifa, Israel and CCM, Department of Anesthesiology, Montefiore Med Ctr, Bronx, NY 10467

Considerable evidence has been accumulated to suggest that high amino acid loads increase renal plasma flow and glomerular filtration rate (GFR) in normal conditions as well as in chronic renal failure (1). In acute renal failure, management is much easier when diuresis is conserved, but large amounts of potentially toxic furosemide are necessary to assure this. We studied the effects of moderate versus high amino acid infusion in patients with acute renal failure.

Fourteen patients with creatinine clearance (CC) below 50 ml/min were randomized in 2 groups receiving 2000 nonprotein calories with 75g (Group 1) or 150g (Group 2) of amino acids for 3 days, with approval of the Helsinki Committee, Rambam Med Center, Haifa, Israel. Daily measurements were made of blood urea nitrogen (BUN), creatinine, and Na; urinary urea, Na and creatinine; fluid output and balance; CC; nitrogen balance; Na balance; and amount of furosemide.

No differences were noted for BUN, serum creatinine, serum Na, CC, or Na balance. Cumulative fluid balance was lower in group 2 ($p=0.02$). The amount of administered furosemide required to reached forced diuresis was decreased by 35 % in group 2 ($p<.02$). Mean nitrogen balance over the 3 days was much more positive in group 2 (2.9 ± 8.3 (SD) g/d versus -10.55 ± 17 g/d, $p<0.02$).

A high load of amino acids seems to increase GFR without modifying BUN or CC. This effect makes it easier to achieve a negative water balance and allows lower doses of furosemide, reducing the risks of toxicity related to this drug. The mechanism could involve hormones or prostaglandin metabolites (1). We conclude that high doses of amino acids are useful in acute renal failure by decreasing positive water balance, lowering potentially toxic furosemide levels and increasing nitrogen balance.

References.
1. Kidney Int 36; S64-S67, 1989

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TITLE: GLYCEROL AS A FUEL SUBSTRATE IN MULTIPLE TRAUMA.

AUTHORS: P Singer MD, S Bursztein MD, DH Elwyn PhD, V Kvetan MD, J Askanazi MD

AFFILIATION: Depts of Intensive Care, Rambam Med Ctr, Haifa, Israel, and Montefiore Med Ctr, Bronx, NY 10467

Acutely ill patients are often hyperglycemic; administration of glucose as nutritional support exacerbates this. The present study examined whether administering glycerol as a fuel instead of glucose would promote N retention without the side effects of glucose.

Twenty patients suffering multiple trauma received 1.33 times their measured energy expenditure (EE). The daily TPN regimen was composed of 1.5g/kg of amino acids, 100 g of fat and the remaining calories as glucose (GLU: 11 patients) or glycerol (GLY: 9 patients) randomly. The study was approved by the Helsinki Committee, Rambam Med Ctr, Haifa, Israel. Biological parameters were followed at day 0, and at 1 and 3 days following the infusion. VO2, VCO2, RQ and resting EE (REE) were measured by indirect calorimetry. N balance was calculated daily using urinary urea N.

The two groups were similar in trauma severity and metabolic parameters. BUN, Na, hematocrit, pH and albumin levels were normal. Free fatty acid and glucagon increased similarly in both groups. Plasma insulin levels increased 2 fold in GLY and 3 fold in GLU. Insulin requirements were lower in GLY. Exogenous results are expressed as mean ± SD.

	GLYCEROL			GLUCOSE		
DAYS	0	1	3	0	1	3
GLUCOSE	163	152	144**	146	222	170
(mg/dl)	36	32	12	40	102	44
GLYCEROL	40	296+	665++	18	47**	66**
(mg/dl)	12	272	465	12	36	69
TRIGLYC	105	322+	195**	96	196	289+
(mg/dl)	65	313	98	53	99	164
REE	1813	1903	1750*	1796	2048	2011
kCal/day	299	273	274	358	273	428
T. Prot.	5.5		6.0++	5.3		5.3
g/l	0.4		0.3	0.8		0.7

+p<.05, ++p<.02 from baseline
*p<.05, **p<.02 between GLU and GLY

Liver test functions were not significantly changed. N balance was comparable in both groups. VO2, VCO2 and RQ showed no significant changes.

Large amounts of glycerol may be safely substituted for glucose in trauma patients. REE and concentrations of glucose and triglycerides are reduced.