Plasmalyte® use in perioperative care of liver transplant recipients: the physiological fluid

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Background and goal of study:

Fluid therapy in perioperative care of liver transplant recipients is one of the key stones of the correct management of these kind of patients. The amount, the moment and the type of fluid is on continuous debate due to different causes. Giving too much fluid to these patients can be deleterious by diluting the coagulation factors and excessive sodium input that can cause neurological damages.

Plasmalyte® is the most physiological crystalloid fluid and could be appropriate to use in liver transplant patients. The goal of our study is to evaluate the use of a Plasmalyte® fluid regimen and the changes in acid-base status, electrolyte disorders and fluid balance.

Electrolitos	Plasmalyte®
Na (mmol/l)	140
K (mmol/l)	5
Ca (mmol/l)	0
Mg (mmol/l)	1.5
Cl (mmol/l)	98
HCO3	0
Lactato	0
Acetato	27
Malato	0
Gluconato	23
pH	6,5 - 8,0
Osm (mOsm/l)	295

Material and methods:

Prospective study of all liver-transplanted patients in the Hospital General Universitario de Alicante between September 2012 and March 2014. We included demographic data, MELD scale and the reason for the transplant. At the beginning of the surgery and during all the surgery phases (hepatectomy, anhepatic, reperfusion and neohepatic) we measured glucose, pH, lactate, base deficit, bicarbonate and all electrolytes.

Results and Discussion:

We included 75 patients (61 male, 14 female), of 58 ± 9 years old. Weight 78 ± 16 Kg, height 163 ± 28 cm. MELD score 15 ± 6. Our patients are usually hyponatremic (Na < 135, 44/72, 61%). We also found them hypercloremic (Cl > 109, 19/71, 27%) and acidotic (pH < 7,35 14/71, 19,7%).

Acid-base changes during the surgery (table 1):

	Basal	Hepatectomy	Anhepatic	Reperfusion 1 minute	Reperfusion 5 minutes	Neohepatic
Glucose	102,89±35,97	111,14±32,21	101,66±31,61	134,86±39,71	135,63±38,79	148,14±56,36
pH	7,4±0,07	7,37±0,07	7,36±0,07	7,29±0,08	7,31±0,08	7,32±0,06
Lactate	1,27±0,56	2,02±0,79	2,8±1,56	3,97±1,17	3,5±1,33	2,65±1,65
HCO_3^-	22,81±3,05	21,83±3,22	21,27±2,93	18,56±5.23	19,93±2,79	20,95±2,53
Base deficit	-1,36±3,98	-3,11±4,4	-3,49±3,90	-7,07±4,11	-6,03±3,94	-4,49±3,44

Electrolyte changes during the surgery (table 2):

	Basal	Hepatectomy	Anhepatic	Reperfusion 1 minute	Reperfusion 5 minutes	Neohepatic
Mg^{++}	1,82±0,3					2,03±0,23
Cl^-	105,08±4,61					105,25±3,86
Na^+	134,99±6,4					133,85±3,09
Ca^{++}	0,96±0,13	0,9±0,10	0,86±0,2	0,86±0,2	0,85±0,14	0,84±0,10
K^+	3,88±0,67	4,17±0,7	5,41±1,28	5,41±1,28	3,68±0,66	3,71±064

Conclusions:

Plasmalyte® is an appropriate physiological crystalloid for patients during a liver transplant surgery. The special characteristics of this group of patients makes the need to administrate drugs to reverse "iatrogenic" hypercloremic acidosis and hypernatremic states that we sometimes create ourselves.

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