Impact of anaesthetic management on postoperative outcome of patients undergoing cytoreduction surgery with hyperthermic intraperitoneal chemotherapy

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Background and aims

Cytoreductive surgery (CRS) with hyperthermic intra-peritoneal chemotherapy (HIPEC) plays an important role in the management of peritoneal surface malignancy. These procedures are complex and stressful commonly leads to coagulation derangements and electrolytes disturbances. Our aim is to analyze anaesthetic management of HIPEC patients and investigate its impact on patient's outcome.

Methods

We prospectively observed thirty-eight cases with abdominal malignancy underwent HIPEC, (2012–2015). Serial arterial blood gases sampling for electrolytes, blood sugar, coagulation control and maintenance of normovolemia.

Results

Majority of patients were female 23 (60.5%) and ASA III, 23 (60. 5%). Changes in haemodynamics, temperature, glucose, and lactate (Fig.1A-B). Our patients had overall postoperative mortality 42.1%, (Fig.2). Univariate analyses of variables that can affect outcome after HIPEC demonstrated that low haemoglobin, haematocrite, tumour marker (CA19.9), low potassium, calcium, albumin, higher intra operative colloids transfusion ,postoperative activated partial thromboplastin time, bacterial and fungal infections were potentially risk factors affected patient's mortality. Multivariate analysis of those factors showed that lower preoperative calcium (hazard ratio [HR] = 0.116; 95% confidence interval [CI] = 0.033-0.407; P = 0.001), higher plasma transfusion (HR = 1.004; 95% CI = 1.001-1.003; P = 0.012) and higher postoperative bacterial infections (HR = 5.987; 95% CI = 1.009 - 35.54; P = 0.014) were independent predictors of patient death, (Table 1).

Conclusions

Lower preoperative calcium, higher intra-operative plasma protein transfusion and postoperative bacterial infection were independent predictors of patient death after HIPEC. Balanced perioperative management of temperature, acid-base balance together with maintenance of normovolemic status are crucial in that critical procedure.

Fig.1

Fig.2

Table 1.Univariable- and multivariable analysis with respect to overall survival in patients after HIPEC operation

Variable	Univariable cox model			Multivariable cox model		
	HR	(95% CI)	P Value	HR	(95% CI)	P Value
Preoperative MCH	1.094	(1.009-1.186)	0.03			
Preoperative Haemoglobin	0.693	(0.486-0.988)	0.043			
Preoperative HCT	0.864	(0.763-0.978)	0.021			
Preoperative CA19.9	1.03	(1.008-1.053)	0.008			
Preoperative Potassium	0.147	(0.039-0.559)	0.005			
Preoperative Calcium	0.246	(0.096-0.628)	0.003	0.116	(0.033-0.407)	0.001
Preoperative albumin	0.3	(0.093-0.965)	0.043			
Preoperative Total protein	0.657	(0.463-0.965)	0.018			
Intra operative Plasma protein transfusion	1.001	(1-1.002)	0.049	1.004	(1.001-1.003)	0.012
Intra operative Colloids transfusion	1.002	(1.001-1.003)	0.002			
Postoperative APTT with Heparin/sec	1.036	(1.003-1.071)	0.035			
Postoperative Bacterial infection	6.494	(1.471-28.673)	0.014	5.987	(1.009-35.54)	0.049
Postoperative Fungal infection	3.488	(1.185-10.265)	0.023			
Mean Corpuscular Hemoglobin; MCH, hematocrit; HCT, Postoperative partial thromboplastin time; PTT; Preoperative CA19.9; tumor marker

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