

Hyperthermic intraperitoneal chemotherapy (HIPEC) on the electrolytes changes and nefropaty

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Abstract

Objective: Hyperthermia intraperitoneal chemoprophylaxis (HIPEC) is a treatment of peritoneal carcinomatosis with potential iatrogenic. This study was designed to define the effects of HIPEC on renal functions, electrolytes, nefropaty.

Methods: We retrospectively reviewed the perioperative care of 20 patients. After cytoreductive surgery (CS), residual tumors were not present in all cases, or were less than or equal to 3 mm (measured in size). Cisplatin 50 mg / m² plus doxorubicin 15 mg/m² was used. This is a retrospective study evaluating patients receiving cisplatin with doxorubicin during HIPEC.

Findings: 20 patients were identified. Based on the RIFLE classification, patients (2.0%) developed acute renal damage (AKI) with HIPEC after cisplatin. The other patient had renal damage. Comparable mean creatinine levels were observed at baseline and on postoperative 21th day after HIPEC ($p > 0.05$). The incidence of hypomagnesaemia increased to 10% ($p = 0.02$) on the 5th day and to 5% on the 21th day ($p > 0.05$) after HIPEC.

Conclusion: Nephrotoxicity and permanent renal dysfunction may rarely occur in cisplatin therapy with HIPEC. We should closely monitor postoperative Mg levels in patients who have undergone HIPEC administration. Doxorubicin may have cardiotoxic side effects.

Introduction

All patients received HIPEC during general anesthesia. Standard induction was 8 mg/kg pentothal, 1 μ /kg fentanyl, and 6 mg/kg rocuronium intravenously. In the case of all patients in the place were opened as MAC:1 sevoflurane and 40% Oxygen + 60% nitrogen was given. TOF and BIS monitorisations were standardized. After debarking operation, HIPEC was performed using a 0.9% isotonic solution of cisplatin + doxorubicin for 40 minutes at 41-42°C [1-4]. All patients underwent open perfusion. Metabolic, electrolyte and hemodynamic changes were noted during chemo-fusion, as well as postoperative metabolic, electrolyte and hemodynamic changes recorded on days 3, 5 and 21 [5-8].

Methods

We retrospectively reviewed the perioperative care of 20 patients. After cytoreductive surgery (CS), residual tumors were not present in all cases, or were less than or equal to 3 mm (measured in size). Cisplatin 50 mg/m² plus doxorubicin 15 mg/m² was used. This is a retrospective study evaluating patients receiving cisplatin with doxorubicin during HIPEC.

Comorbidities and effects of nephrotoxic drugs were found. Renal function parameters, including serum magnesium levels, were also collected on preoperative and postoperative creatinine levels and on days 1, 5 and 21 post HIPEC. Perioperative urine output (UO) was also recorded.

Results

From January 2010 to January 2016, 20 patients were treated. Chemofusion with 0.9% isotonic resulted in transient significant hyponatremia and metabolic acidosis. While major morbidity occurred in 5% of patients, there was no mortality for 6 months [9,10]. Chemical interaction with doxorubicin led to mild hepatic toxicity but not significant. Hypomagnesemia was found to be significant when serum magnesium levels were below 0.7 mmol / L. On the 2nd day after operation in one patient in V4, V5, V6 T negative. T negativity

Table 1. Demographic Datas

	All patients n=20	Patients with RIF	p Value
Female, %	20 (94.3%)	2 (10%)	
Age (years)	49.6 \pm 10.1	47.50 \pm 10	0.65
Weight (kg)	70.9 \pm 14.7	75.1 \pm 29	0.01
BSA (m ²)	1.75 \pm 0.6	2.06 \pm 0.6	0.042
Comorbidities	-	-	-
Diabetes mellitus	4(20%)	1 (50%)	0.43
Hypertension	5 (25%)	2 (100%)	0.045

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Table 2. Electrolytes data

	Pre-HIPEC (n=20)	Post-HIPEC (n=20)
Sodium(mmol/L)	135	135
Potassium(mmol/L)	4.2	4.3
Chloride(mmol/L)	108	104
Calcium	8.1	7.1
Bicarbonate(mmol/L)	19	21
Creatinine	0.39	0.45
BUN(mg/dL)	19	21
GFR (ml/min/1.73 m ²)	90.50 ± 16.00	80.13 ± 23.02
Mg (1.2 - 2.6 mg/dL)	2.4 ± 0.37	1.78± 0.50
PH	7.42	7.33

Table 3. RIFLE classification for GFR: glomerular filtration rate; UO: urine output; ESRD: end-stage renal disease.

Category	GFR criteria	UO criteria
Risk (R)	Increased creatinine level × 1.5 or GFR decrease > 25%	UO < 0.5 mL/kg/h × 6 h
Injury (I)	Increased creatinine level × 2 or GFR decrease > 50%	UO < 0.5 mL/kg/h × 12 h
Failure (F)	Increased creatinine level × 3 or GFR decrease > 75% or creatinine level > 4 mg/dL	UO < 0.3 mL/kg/h × 24 h or anuria × 12 h
Loss (L)	Persistent acute renal failure or complete loss of renal function for > 4 weeks	
ESRD (E)	ESRD for > 3 months	

improved within a few days. Troponin I and CK-MB never elevated in this patient. Transient hypotension developed in two patients. Doxorubicin may have cardiotoxic side effects.

Conclusion

Cytoreduction with HIPEC using high dose cisplatin and leads to manageable metabolic and electrolyte disturbances, rarely

nephrotoxicity and frequent mild hepatic toxicity without noticeable impact on postoperative morbidity. Doxorubicin may have cardiotoxic side effects.

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