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Epidemiology and risks for infection following cytoreductive surgery and hyperthermic intra-peritoneal chemotherapy (CRS- HIPEC) at an Australian centre

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Background

CRS-HIPEC is associated with improved cancer survival but increased risk of infection in patients with abdominal-pelvic malignancy[1]

Others reports peri-operative infection in up to 48% of all patients undergoing CRS-HIPEC [2,3,4]

We evaluated risks factors for and characteristics of infectious complications at an Australian cancer centre.

Methods

Patients undergoing CRP-HPEC from January 2016 at Peter MacCallum Cancer Center were retrospectively reviewed

Malignancy type, comorbidities, perioperative risk factors and infectious complications were captured, using standardised definitions for surgical site infection.

Association between risk factors and infection outcomes was evaluated by logistic regression modelling.

Results

100 consecutive patient that underwent CRS-HIPEC from January 2016 until May 2018 were identified and included in the analysis

Forty-six patients underwent CRS-HIPEC for colorectal cancer and 34 for pseudomyxoma peritonei (PMP). The remainder had underlying appendiceal cancer without PMP (*n*=12), primary peritoneal mesothelioma (*n*=4) or ovarian cancer (*n*=4). Eight-nine underwent first CRS-HIPEC, whilst 11 underwent second CRS-HIPEC. No patients received chemotherapy in the 30 days prior to surgery

43% (43/100) patients experienced an infectious complication (Table 1). Surgical site and intra-abdominal collection the most frequently encountered, comprising 65% of all infections

In most, infection onset was within 7 days post-operatively and median length of hospitalisation was 19 days for patients with infection, compared to 8 days for those without (*p*=0.000).

Infectious risk associated with small bowel resection and number of viscera resected on univariate analysis while an elevated creatine was protective against infection (Table 2)

Small bowel resection and elevated creatinine we associated with infection risk on multivariate analysis

Infection	Median time to onset, days (range)	Pathogens (n)	Rate per 100 patients (95% CI)
Infection at surgical site			
SSI (total)	7 (2-38)		27 (18.6-36.8)
Superficial SSI	7 (6-24)	Pseudomonas aeruginosa (1), Candida albicans (1), Escherichia coli (1)	5 (1.6-11.3)
Deep SSI	5 (2-11)	-	5 (1.6-11.3)
Organ/space SSI	17 (17)	Escherichia coli (3), Pseudomonas aeruginosa (1),	17 (10.2-25.8)
Abscess/collection	18 (1-19)	Escherichia coli, Enterococcus faecium & Candida albicans (1)	1 (0.02-5.4)
Other infections			
Respiratory tract infection	5 (1-19)	-	9 (4.2-16.4)
Urinary tract infection	7 (1-29)	P. aeruginosa (2), ESBL E. coli (1), ESBL Klebsiella pneumoniae (1)	11 (5.6-18.8)
Gastrointestinal infection	4 (3-5)	Clostridium difficile (2)	2 (0.2-7.0)
Peripheral venous catheter-related infection	12	Staphylococcus epidermidis (1)	1 (0.02-5.4)
Post-operative sepsis	5 (2-17)	P. aeruginosa (2), E. raffinosus (1), E. faecium & C. albicans (1)	15 (8.6-23.5)

Table 1. Infectious complications following HIPEC-CRS: burden, aetiology and timing of onset

Conclusions

We report an overall infectious complications rate 43%, comparable to other series

Complications occur largely in the early post operative period (within 7 days)

Infections occurred most frequently at the surgical site

Findings support the need for multimodal programs to reduce the risk of a broad range of infections in this population. Higher-risk subgroups, including those with small bowel resection and increased number of resected viscera, may benefit from enhanced monitoring.

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