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Quality of life after cytoreductive surgery plus hyperthermic intraperitoneal chemotherapy: A prospective study of 216 patients

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Abstract

Introduction: Cytoreductive Surgery (CRS) and Hyperthermic Intraperitoneal Chemotherapy (HIPEC) have demonstrated promising results in the treatment of peritoneal carcinomatosis (PC). The purpose of this study was to assess the impact of this combined procedure on quality of life (QoL).
Materials and methods: A prospective single centre study of 216 consecutive patients treated with CRS and HIPEC was conducted using the Gastro-Intestinal Quality of Life Index questionnaire (GIQLI), completed preoperatively and at 1, 3, 6 and 12 months.
Results: Questionnaire compliance was 81%, 90%, 89%, 89% and 74% at baseline, 1, 3, 6 and 12 months respectively. QoL was significantly decreased up to 6 months and returned to baseline at 12 months. In multivariate analysis, factors decreasing QoL were origin of PC at 3 months, presence of stoma at 6 months and length of surgery over 270 min and disease recurrence at 12 months.
Conclusions: Despite morbidity associated with CRS and HIPEC, QoL returned to baseline at one year after surgery. This treatment strategy should be considered for the treatment of peritoneal carcinomatosis.

Keywords: Quality of life; Cytoreductive surgery; Peritoneal carcinomatosis

Introduction

Peritoneal carcinomatosis (PC) is an advanced form of cancer with poor prognosis whatever the origin.[1] The development of therapeutic strategies combining cytoreductive surgery (CRS)[2] with hyperthermic intraperitoneal chemotherapy (HIPEC)[3] improve loco-regional control allowing a curative approach in selected cases.[4-9] This combined procedure is currently the only treatment that provides a hope of cure.[10,11] It is an aggressive treatment strategy with reported morbidity ranging from 25 to 41% and mortality of 0–8%.[12]

The modalities of CRS and HIPEC are still not standardized and the impact of this combined procedure on quality of life (QoL) remains poorly understood. Although experience with CRS and HIPEC in specialized centres is increasing, it is still not a widely used treatment for PC. Studies assessing QoL in these patients will therefore include only small numbers of patients making robust conclusions difficult. This makes decision for both patient and the oncology team more challenging as the balance between risk and benefit from treatment is harder to estimate. The purpose of this study was to assess QoL during the year following CRS and HIPEC and to determine the main factors that influence QoL.

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Materials and methods

Consecutive patients who underwent CRS and HIPEC for peritoneal carcinomatosis, between January 2007 and February 2011, at Lyon Sud Hospital were included in this prospective study, after informed consent. Patients who died post-operatively (within 45 days following surgery) were excluded.

Diagnosis and surgical procedure

The diagnosis of peritoneal carcinomatosis was suspected or established preoperatively according to radiological and pathological data. Treatment with chemotherapy or radiotherapy was recorded. A Prior Surgical Score (PSS) was obtained as described by Sugarbaker.[13] Surgery was performed under general anaesthesia with patients in a supine position. A laparotomy was performed with an incision from xiphoid to symphysis pubis. The extent of carcinomatosis was assessed using Gilly's classification[14] and the Peritoneal Cancer Index (PCI).[13] CRS was undertaken to obtain a complete macroscopic cytoreduction with curative intent. The duration of surgery was recorded. Residual tumour was stratified according to the Completeness of Cytoreduction score. The cytoreduction was considered complete if a CC score of 0 or 1 was achieved. Surgery was considered major if it lasted longer than 7 h, or if one colonic anastomosis was performed, or if more than 4 peritonectomies were performed. HIPEC was performed using the closed abdomen technique, with the choice of cytotoxic agent and duration of hyperthermia dependant on the origin of carcinomatosis. Cytotoxic agents used were cisplatin, mitomycin C, oxaliplatin and irinotecan, alone or in combination.

Postoperative complications were classified according to the National Cancer Institute's (NCI) Common Terminology Criteria for Adverse Events (CTCAE)[15] version 4.0. A Grade III complication corresponded to severe or medically significant complications but not immediately life-threatening, and a Grade IV complication corresponded to life threatening complication needed urgent intervention.

Gastro-intestinal quality of life index (GIQLI)

Patients completed a QoL questionnaire before surgery (baseline) and at 1, 3, 6 and 12 months after the procedure. The baseline and 1-month questionnaires were completed during the pre-operative and post-operative outpatient visit. The 3, 6 and 12 months questionnaires were sent by mail. Psychological support was provided if needed and continued during the follow up period if required.

GIQLI (Gastro-Intestinal Quality of Life Index), validated in its French translation[16] in 1999, was used. There were 36 questions rated from 0 to 4 (0 being worst and 4 best assessment) for a maximal score of 144. The questions were distributed in five subscales: symptoms (19 questions), physical function (7 questions), feelings (5 questions), social integration (4 issues) and effect of any medical intervention or treatment (1 question). If a question was not answered the assigned score was 0. Questionnaires were considered as incomplete if more than 2 questions were not answered. Patients were excluded from the study if they had 4 incomplete questionnaires. The absolute score was defined as the total number of points. In order to compare symptoms with regard to the others dimensions (emotion, physical condition and social integration), a relative score of 0–4 was created for every subscale, making a total score of 20.

Statistical analysis

Statistical analysis were performed using SAS version 9.2® (SAS Institute Inc., Cary, North Carolina, USA).

Descriptive analysis: The variables were described using numbers and percentages for qualitative variables and using mean, median, minimum and maximum for quantitative variables.

GIQLI evolution and its sub-scores over time were tested by mixed models.

Quality of life deterioration at 3, 6 and 12 months was defined by a decrease of at least 10% respectively in scores at 3, 6 and 12 months compared to baseline. A selection of variables was compared between patients with a deterioration versus patients with no deterioration in QoL using a chi square test (or Fisher exact test when conditions for Khi^2 were not fulfilled) for categorical data or using a non-parametric Mann–Whitney test when it came to quantitative variables. Factors analysed were: age, gender, Gilly score, PCI, length of surgery greater than 270 min, major resection, CC score, origin of PC (Colorectal, ovarian, peritoneal or other), complications grades III–IV, stoma formation and disease recurrence.

Variables significant at 15% in univariate analysis were introduced into a multivariate logistic regression model with stepwise selection of variables. Odds Ratios with 95% interval confidence were estimated on multivariate analysis.

Results

Patients and follow up

Between January 2007 and February 2011, 226 consecutive patients treated by CRS and HIPEC for peritoneal carcinomatosis were prospectively studied. Ten patients who died postoperatively (within 45 days of surgery) were excluded. Descriptive data of surgical procedure are reported in Table 1. The average age was 57 ± 10 years. The origin of peritoneal carcinomatosis was ovarian in 76 patients (35%), colorectal in 57 (26%), pseudomyxoma peritonei in 40 (19%, 16 grade I and 24 grade II–III), primary serous peritoneal carcinoma in 8 (4%), peritoneal mesothelioma in 13 (8%), gastric in 12 (6%), and a combination of sarcomatosis, desmoplastic carcinomatosis, endometrial adenocarcinoma and squamous cell carcinoma