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Review

Treatment and prevention of peritoneal carcinomatosis from gastric cancer by cytoreductive surgery and hyperthermic intraperitoneal chemotherapy: Overview and rationale

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Abstract

Peritoneal carcinomatosis (PC) from gastric cancer is a condition with a very bleak prognosis. Most authors consider it to be a terminal disease and recommend palliative therapy only. Multimodal therapeutic approaches to PC have emerged in the last decades, combining cytoreductive surgery (CRS) and peritonectomy procedures with perioperative intraperitoneal chemotherapy (IPEC), including hyperthermic intraperitoneal chemotherapy (HIPEC) and/or early postoperative intraperitoneal chemotherapy (EPIC).

We reviewed the pertinent literature concerning the HIPEC modality both for the treatment of established PC and the prevention of peritoneal recurrence after potentially curative gastric cancer (GC) surgery. Basically, the two procedures relate to different aspects of GC and they are not comparable, since the latter has been used as an adjuvant when PC is still not macroscopically evident and the former has been exclusively used in advanced gastric cancer stages with peritoneal dissemination. Data supporting beneficial effects once gastric PC is already manifest is scarce and limited to few centres with specific experience in this field. Conversely, with regards to the peritoneal perfusion for preventing PC in high risk gastric cancer patients, there are phase III trials and meta-analysis which support beneficial effects resulting from the HIPEC procedure. To offer a baseline guide, we summarized the actual status and general outcome obtained by this multimodal technique, in association or not with CRS as treatment of advanced GC.

Keywords: Gastric cancer; Peritoneal carcinomatosis; Perioperative intraperitoneal chemotherapy; Hyperthermic intraperitoneal chemotherapy

Introduction

The peritoneum is a preferential site for gastric adenocarcinoma (gastric cancer, GC) dissemination. There is no established treatment for GC with peritoneal seeding. The lack of efficient systemic therapy[1] with the fact that a substantial number of synchronous peritoneal carcinomatosis (PC) is confined to the peritoneal cavity and is a localized disease has been the impetus for many investigators to study intraperitoneal administration of cytotoxic agents (intraperitoneal chemotherapy IPEC) in both therapeutic and adjuvant settings. Diverse modalities of intraperitoneal delivery of the perfusate have been introduced over time, i.e. peri-operatively, such as normothermic intraperitoneal chemotherapy (NIPEC) and hyperthermic intraperitoneal chemotherapy (HIPEC), or post-operatively, such as early postoperative intraperitoneal chemotherapy (EPIC) and delayed postoperative intraperitoneal chemotherapy (DIPEC).[2] The combination of HIPEC, first described in 1980 by Spratt et al.,[3] with cytoreductive surgery (CRS) has undergone an especially important development during the last 30 years thanks to both its encouraging favourable oncologic results and its global superiority compared to alternative intraperitoneal modalities. The theoretical advantage of the HIPEC is to add the potentiating effect of hyperthermia on the cytostatic drug property to the high local concentration of the used agents, as well as the direct cytotoxic effects of heat.[4,5] The efficacy of HIPEC associated to surgery against PC of gastric origin appears

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