

Therapy-dependent survival and prognostic factors in patients with colorectal peritoneal carcinomatosis – a population-based study

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Background

Various studies showed a significant survival benefit for cytoreductive surgery (CRS) with HIPEC (hyperthermic intraperitoneal chemotherapy) compared to surgery and systemic chemotherapy in patients with peritoneal carcinomatosis (PC). However, a recent prospective randomized study reported no superiority of CRS and HIPEC to CRS with chemotherapy, so that now, independent of the CRS, the effectiveness of HIPEC is unclear.

The aim of this multicenter, retrospective cohort study was the analysis of treatment-dependent overall survival (OS) after CRS with HIPEC compared to surgery and subsequent chemotherapy in patients with PC.

Methods

Based on the clinical cancer registry of the Regensburg Tumor Center, a retrospective, multicenter cohort study was performed on 941 patients diagnosed with colorectal PC between 2004 and 2018. Primary endpoint was the therapy-dependent OS estimated using Kaplan-Meier method and multivariable Cox-regression. Risk adjustment was performed for age, sex, primary tumor stage, grading and localization, extraperitoneal tumor spread, syn- and metachronous PC.

Results

Table 1: Characteristics of patients according to different therapy groups

Patient characteristics	CRS + HIPEC - Patients/%	Surgery + Chemotherapy - Patients/%	Total - Patients/%
Gender			
Male	30/47.6	89/50.6	119/49.8
Female	33/52.4	87/49.4	120/50.2
Age			
<50	13/20.6	23/13.1	36/15.1
50-59	21/33.3	40/22.7	61/25.5
60-69	16/25.4	52/29.5	68/28.5
>70	13/20.6	61/34.7	74/31.0
Localization			
Colon	57/90.5	156/88.6	213/89.1
Rectum	6/9.5	20/11.4	26/10.9
Grading			
Well	27/42.9	104/59.1	131/54.8
poor	33/52.4	66/37.5	99/41.4
T stage of primary			
T1-3	20/31.7	66/37.5	86/36.0
T4	40/63.5	103/58.5	143/59.8
N stage of primary			
N0	13/20.6	31/17.6	44/18.4
N+	45/71.4	133/75.6	178/74.5
Onset of PC			
Synchronous	48/76.2	136/77.3	184/77.0
metachronous	15/23.8	40/22.7	55/23.0
Localization of metastases			
PC + extraperitoneal	17/27.0	76/43.2	93/38.9
PC only	46/73.0	100/56.8	146/61.1

In the included 941 cases, 63 cases were treated with CRS and HIPEC (6.7%), 176 cases (18.7%) with surgery followed by chemotherapy (**Table 1**). Median OS after CRS and HIPEC was 40.5 months, after surgery with chemotherapy 21.4 months. Two-year OS after CRS and HIPEC was 58.2% (surgery with chemotherapy 41.8%); 3-year OS 50.1% and 21.4%, resp. (log rank $p < 0.001$) (**Figure 1**). After risk adjustment, CRS and HIPEC persisted to prove superior to surgery with chemotherapy (HR 0.529, CI 95% 0.363-0.770, $p < 0.001$). In addition, significant factors influencing OS were age, tumor grading, presence of extraperitoneal metastases, T and N status, onset of PC (**Table 2**).

Table 2: Multivariable analysis of factors influencing overall survival

	HR	95% CI	p value
Therapy groups (CRS+HIPEC vs. Surgery and chemotherapy)	0.529	0.363-0.770	0.001
Age (50-59 vs. <50)	0.563	0.346-0.916	0.021
Grading (G3/4 vs. G1/2)	1.392	1.020-1.900	0.037
T status (T4 vs. T1-3)	1.610	1.165-2.226	0.004
N status (N+ vs. N0)	2.256	1.467-3.469	≤ 0.001
Meta- vs. synchronous onset of PC	1.687	1.133-2.510	0.01
PC vs. additional extraperitoneal metastases	0.696	0.495-0.978	0.037

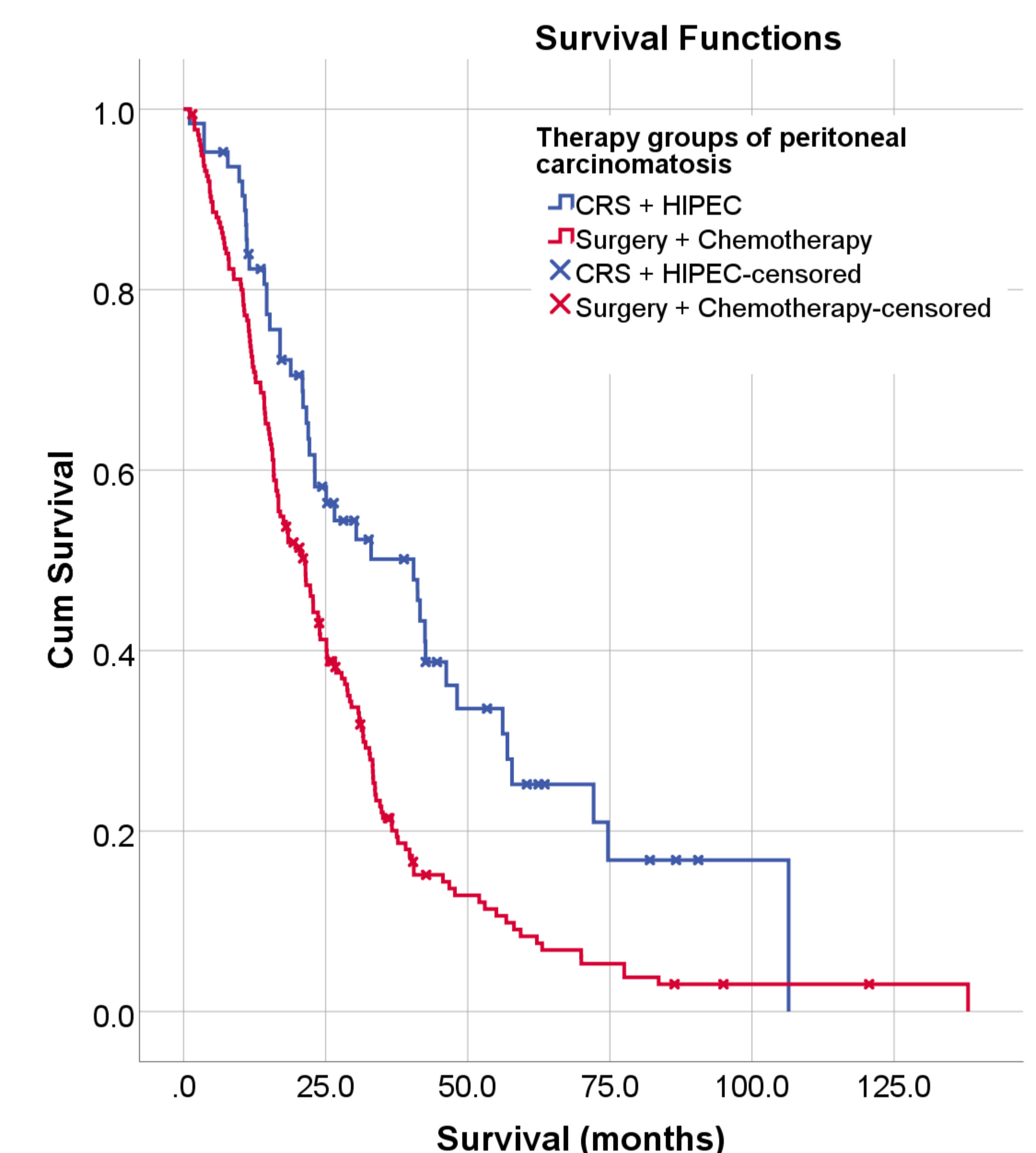


Figure 1: Overall survival for patients with different treatment of PC

Conclusion

In line with most randomized and retrospective studies to date, this population-based analysis shows a significant survival benefit of CRS with HIPEC versus surgery and subsequent chemotherapy.