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Review

Postoperative mortality after primary cytoreductive surgery for advanced stage epithelial ovarian cancer: A systematic review

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ABSTRACT

Objective. Accurate estimation of the risk of postoperative mortality (POM) is essential for the decision whether or not to perform cytoreductive surgery in a patient with advanced stage ovarian cancer. To ascertain modern reference figures, a systematic review of studies reporting POM after primary cytoreductive surgery for advanced stage epithelial ovarian cancer (EOC) was performed.

Materials and methods. A Medline search was performed to retrieve papers on primary cytoreductive surgery for advanced stage EOC. Twenty-three papers met the inclusion criteria and were reviewed.

Results. According to population-based studies, POM after primary cytoreductive surgery for EOC is 3.7% on average. Single centre studies report an average rate of 2.5%. The overall mean POM is 2.8%. POM is more frequent for elderly women and after extensive procedures. Accurate information on age-specific and procedure-specific rates could not be obtained.

Conclusion. POM rates after surgery for EOC are satisfactorily low. There is a clear need for reliable reference figures for mortality after debulking surgery in the elderly.

Contents

Introduction

Epithelial ovarian cancer (EOC) continues to be the leading cause of death from gynaecological cancer [1]. Cure rates are low because most patients are diagnosed with advanced disease. Treatment is based on cytoreductive surgery and platinum-based chemotherapy. Individual prognosis depends on FIGO (International Federation of Gynaecology and Obstetrics) stage [2] and the ability to perform

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Table 1
Review of population-based studies describing postoperative mortality after primary cytoreductive surgery for advanced stage EOC.

Article	Publication year	Country	*N*	Median age (years)	FIGO stage	Optimal Cytoreduction (% RD)	POM *N* (%)
Soegaard [30]	2005	Denmark	83	NA	III–IV	79%<1 cm	4 **(4.8)**
Engelen [23]	2006	Netherlands	240	NA	III	52%<2 cm	6 **(2.5)**
Marx [31]	2007	Denmark	292	62	III	39%<1 cm	13 **(4.4)**

N = number of patients; POM = postoperative mortality; RD = residual disease; NA = not applicable.

optimal cytoreductive surgery [3–5]. To achieve a minimal residual tumour load, surgery may need to be quite extensive and can be accompanied by postoperative complications.

Postoperative morbidity and mortality depend upon the extent of surgery, age, performance status and co-morbidity [6–9]. Cytoreductive surgery clearly improves survival but may be withheld if the operative risk is deemed too high. The role of upfront cytoreductive surgery in patients with unresectable disease is under debate. Several studies suggest that neo-adjuvant chemotherapy followed by interval surgery will lead to similar survival with less operative morbidity [10–12].

POM is generally defined as death from any cause within 30 days of operation and has been suggested as a performance indicator for other types of cancer. For ovarian cancer, POM is considered to be low but may yet be useful as an objective parameter of surgical care. To obtain reference standards for POM, we performed a systematic review on published POM rates after primary cytoreductive surgery for advanced stage EOC.

Material and methods

Search methods

We performed a Medline search of English-language articles published between January 1, 1981, and March 1, 2008. The keywords used were: “ovarian carcinoma”, “ovarian cancer”, “ovarian neoplasma” and “cytoreductive surgery”, “surgical outcome”, “30-day mortality”, “in-hospital mortality”, “postoperative death”, “postoperative mortality” and “postoperative complications”. Additionally, the Cochrane Library and Embase were searched for any relevant reports.

Inclusion criteria

POM was defined as death from any cause within 30 days of operation and in-hospital mortality as death of a patient without being discharged after surgery. Manuscripts were included if POM or in-hospital mortality after primary cytoreductive surgery for advanced stage (FIGO stage III/IV) EOC, fallopian tube or peritoneal cancer was reported.

Studies reporting results from interval cytoreductive surgery, surgery for recurrent ovarian cancer and those reporting results of second-look laparotomy were excluded from analysis.

Data extraction

Two authors (C.G.G. and R.A.D.) reviewed the articles that fulfilled the inclusion criteria. From the selected articles we abstracted the following information: name of the first author, year of publication, type of patient cohort, type of surgery, number of patients, median patient age, FIGO stage, optimal cytoreduction rate, definition of optimal cytoreduction, number and percentage of patients who died in the postoperative period. If mentioned, cause of death information was also extracted. Cause of death was reclassified according to the methodology proposed by Waljee et al. [13]. In this classification the complication that attributed most to the patient's death during a postoperative course has to be assigned and stratified in five main categories (Table 4).

Data analysis

Included studies were divided in two main categories: studies reporting results of general primary cytoreductive surgery and

Table 2
Postoperative mortality after primary debulking surgery for advanced stage EOC reported from single institutions.

Article	Year of publication	*N*	Median age (years)	FIGO stage	Optimal cytoreduction (% RD)	Definition POM	POM *N* (%)
1980–1990							
Hacker [32]	1983	47	58	III–IV	66<1.5 cm	30 d	1 **(2.1)**
Chen [33]	1985	60	59	III–IV	100<1.5 cm	30 d	1 **(1.7)**
Piver [34]	1986	50	62	III–IV	76≤2 cm	30 d	0 **(0)**
Heintz [35]	1986	70	58	III–IV	46≤1 cm	H	2 **(2.9)**
1991–2000							
Eisenkop [36]	1992	263	61	IIIC–IV	54≤1 cm	28 d	16 **(6.1)**
Venesmaa [37]	1992	264	NA	III–IV	NA	30 d	4 **(1.5)**
Marchetti [19]	1993	70	63	III–IV	37≤2 cm	30 d	1 **(1.4)**
Guidozzi[38]	1994	30	56	III–IV	76≤2 cm	30 d	2 **(6.7)**
Michel [39]	1997	152	NA	IIIB–IV	91≤2 cm	30 d	2 **(1.3)**
Liu [40]	1997	47	NA	IV	30≤2 cm	30 d	1 **(2.1)**
Lichtenegger [41]	1998	117	NA	III–IV	57≤2 cm	30 d	2 **(1.7)**
Vergote [12]	1998	112	56	III–IV	89≤1.5 cm	30 d	7 **(6.2)**
Bristow [42]	1999	84	61	IV	30≤1 cm	30 d	5 **(6)**
Suzuki [43]	1999	45	NA	III–IV	57≤2 cm	30 d	0 **(0)**
2001–2008							
Bristow [44]	2001	45	62	IIIB–IV	84≤1 cm	30 d	1 **(2.2)**
Eisenkop [45]	2003	408	63	IIIC	96≤1 cm	30 d	10 **(2.5)**
Eltabbakh [46]	2004	72	60	III–IV	49≤1 cm	30 d	1 **(1.4)**
Chi [47]	2004	140	60	IIIC–IV	63≤1 cm	30 d	1 **(0.7)**
Aletti [48]	2006	244	64	IIIC–IV	NA	30 d	3 **(1.2)**
Susini [15]	2007	47	NA	III–IV	45<1 cm	30 d	0 **(0)**

N = number of patients; RD = residual disease; 30 d = 30-day mortality; H = in-hospital mortality; NA = not applicable.