The outcomes of ovarian cancer treatment are better when provided by gynecologic oncologists and in specialized hospitals: a systematic review

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CRD summary
This review assessed the efficacy of specialised care for the treatment of ovarian cancer and concluded that the outcome of ovarian cancer was better when treatment was provided by a gynecologic oncologist or in a specialised hospital than in non-specialised settings. A number of limitations in the review may mean that, despite promising results, the authors conclusion is overstated.

Authors’ objectives
To determine the efficacy of specialised care for patients with ovarian cancer.

Searching
PubMed was searched from January 1991 to November 2006; search terms were reported. In addition, Cochrane Database of Systematic Reviews (CDSR), DARE, NHS-EED, HTA database, Cochrane Central Register of Controlled Trials, Current Controlled Trials and ClinicalTrials.gov were searched using a single search term (ovarian cancer).

Study selection
Studies that assessing the effect of type of hospital (for example, characterised by procedure volume or teaching status) or surgeon (specialist or general gynecologist) on the outcome of treatment of patients with epithelial ovarian cancer were eligible for inclusion in the review. Case reports and case series were excluded from the review. Most of the included studies were retrospective in design (no randomised controlled trials were found). Eligible outcomes were survival, staging according to guidelines or adequate staging, optimal debulking (defined as cytoreduction of the tumour to residual disease less than 2cm, unless specified otherwise), postoperative mortality and chemotherapy regimes. Additional postoperative complications were also reported. In most cases, cancer stage was classified according to the FIGO system (disease stage ranged from I to IV in the included studies). Studies were also required to meet a minimum quality criteria to be eligible for inclusion in the review and include patients treated from 1990 onwards. Where reported, participants mean age ranged from 58 to 74.6 years.

The authors stated neither how the papers were selected for the review nor how many reviewers performed the selection.

Assessment of study quality
Studies were required to have a population-based study cohort and to separately report the results of general gynecologists, gynecological oncologists and general surgeons in order to meet minimum quality criteria. The authors did not state how the validity assessment was performed.

Data extraction
Relative risks were calculated for cohort data and odds ratios were calculated for case-control studies with 95% confidence intervals (CIs). The authors stated neither how data were extracted nor how many reviewers performed the data extraction.

Methods of synthesis
Studies were grouped by determinant (specialist or hospital type) and outcome. Where possible, studies were pooled in a meta-analysis using a fixed-effect model in the absence of statistical heterogeneity. Where evidence of heterogeneity was found a random-effects model was performed. Statistical heterogeneity was assessed using the $\chi^2$ test and the $I^2$ statistic. A narrative synthesis was used where pooling was not possible.

Results of the review
Nineteen studies were included in the review. Eleven studies considered the effect of treatment by gynaecologic
oncologists (n=13,045). Fourteen studies looked at the effect of treatment in a specialised hospital (n=23,134). Most of the studies were carried out in the USA or the UK.

**Staging:** Gynecologic oncologists performed more lymph node dissections in patients with FIGO I and II disease (60% to 78% versus 26% to 36%; three studies). The percentage of adequate cancer staging was significantly greater in gynecologic oncologists (43% to 47%) than general gynecologists (15% to 22%) (two studies). Specialist hospitals reported more staging procedures than non-specialist hospitals (two studies).

**Debulking:** A significant difference in favour of gynecologic oncologists compared to general gynecologists was found for optimal debulking to less than 2cm residual disease (relative risk 1.4, 95% CI: 1.2 to 1.5; five studies) and debulking to no residual degree in patients with stage III disease (relative risk 2.3, 95% CI: 1.5 to 3.5; two studies). No evidence of statistical heterogeneity was found. Patients operated on in specialist hospitals had a better chance of receiving optimal debulking than patients operated on in non-specialised hospitals (odds ratios ranged from 2.9 to 6.0; four studies).

**Surgery and chemotherapy:** Patients treated in a specialised hospital were more likely to receive chemotherapy (odds ratio 1.82, 95% CI: 1.08 to 3.07) compared to patients in a non-specialised hospital (four studies). Patients treated by a gynecologic oncologist were more likely to receive chemotherapy compared to patients treated by a general gynecologist (relative risk 1.14, 95% CI: 1.07 to 1.22; five studies). Two studies looked at the difference in chemotherapy rates and survival rates between different providers and found no significant differences; hazard ratios for specialised providers ranged from 0.75 to 0.77 and for general providers ranged from 0.77 to 0.79.

**Postoperative complications:** No statistically significant differences were found in post-operative complication rates between different providers.

**Survival:** Three studies found that treatment by a gynecologic oncologist resulted in longer survival in patients with advanced disease compared with general gynecologists. However, this was not generalisable to the whole patient population: the difference was only significant in one study in women 70 years or older with advanced disease. Other results were less consistent across studies. Treatment in a specialist hospital, compared to a non-specialist hospital, resulted in better survival in five of seven studies.

**Effect of specialised gynecologist versus the effect of specialised hospital:** 18 out of 19 studies reported better outcomes from specialised settings (gynecologist oncologist or specialised hospital, or both). One study found a significant association between hospital volume and overall survival (hazard ratio 0.03), which increased further when surgeon volume was included in the analysis (hazard ratio 0.15). Two studies found that the effect of surgeon specialty could not be explained by surgical volume of the hospital or type of hospital. Three studies found that use of chemotherapy affected the relationship between hospital type and survival.

**Authors’ conclusions**
The outcome of ovarian cancer was better when treatment was provided in specialised settings (gynecologic oncologists or in specialised hospitals) than that provided in non-specialised settings.

**CRD commentary**
The review question was supported by clear inclusion criteria and several sources were searched for relevant papers. It was not clear whether this search was restricted by language, which raised the possibility of language bias. The authors acknowledged the possibility of publication bias. Methods used to select papers, extract data and assess the quality of the studies were not reported, thus the likelihood of reviewer error and bias at these stages could not be assessed. The quality of the included studies was only minimally evaluated. Where studies were pooled, appropriate standard meta-analytic methods were used and statistical heterogeneity was assessed. The authors highlighted a number of limitations, including residual confounding, lack of details relating to the exact characteristics of the hospitals and differences between the included studies. Given the limitations and the lack of reported methodology in the review process, although the results appeared promising the authors conclusion appears to be overstated.

**Implications of the review for practice and research**
**Practice:** The authors stated that patients suspected of having advanced ovarian cancer should be treated in specialised gynecological oncological units by a multidisciplinary team.
Research: The authors did not state any implications for research.

Funding
The study was funded by a grant from ZonMW (project No. 945-06-216) and the Foundation RVVZ (project No. 763).

Bibliographic details
Vernooij F, Heintz P, Witteveen E, van der Graaf Y. The outcomes of ovarian cancer treatment are better when provided by gynecologic oncologists and in specialized hospitals: a systematic review. Gynecologic Oncology 2007; 105: 801-812

PubMedID
17433422

DOI
10.1016/j.ygyno.2007.02.030

Original Paper URL
http://www.sciencedirect.com/science?_ob=ArticleURL&amp;_udi=B6WG6-4NGB9WY-2&amp;_user=10&amp;_rdoc=1&amp;_fmt=&amp;_orig=search&amp;_sort=d&amp;_docanchor=&amp;view=c&amp;_acct=C000050221&amp;_version=1&amp;_urlVersion=0&amp;_userid=10&amp;amp;md5=c48a1d503a900fdd24a2aad16bf26bd

Indexing Status
Subject indexing assigned by NLM

MeSH
Female; Gynecologic Surgical Procedures /standards; Gynecology /standards; Humans; Medical Oncology /standards; Neoplasm Staging; Ovarian Neoplasms /pathology /surgery; Treatment Outcome

AccessionNumber
12007001883

Date bibliographic record published
09/08/2008

Date abstract record published
19/08/2009

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.