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Non-surgical management of ovarian cancer: Prevalence and implications

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HIGHLIGHTS

- 18% of EOC patients in the NCDB did not receive surgical treatment.
- 22% of elderly patients with advanced disease received only systemic treatment; 23% were untreated.
- It is unclear how often deviation from best-practices guidelines is clinically appropriate.

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ABSTRACT

Purpose. To identify prevalence, correlates and survival implications of non-surgically managed epithelial ovarian cancer (EOC).

Methods. The National Cancer Database (NCDB) was queried for EOC cases between 2003 and 2011. Type of treatment, survival data, reasons for non-surgical treatment, clinicopathologic and process-based factors were collected. Logistic regression identified independent predictors of surgical treatment; Cox proportional hazards regression modeled association between time to death and receipt of surgery.

Results. 172,687 of 210,667 patients (82%) received surgical treatment for EOC. 95% of patients treated non-surgically had stage III, stage IV or unknown stage disease. The reason for non-surgical treatment was unclear in 80% of cases. Black race and uninsurance were significantly associated with non-surgical treatment. Median survival time was 57.4 months (95% CI: 56.8–57.9) for surgery with or without systemic treatment compared to 11.9 months (95% CI: 11.6–12.2) for systemic treatment alone and 1.4 months (95% CI: 1.3–1.4) for no treatment. Relative to surgical treatment, the adjusted hazard ratio for death associated with systemic treatment alone was 1.9 ($p < 0.001$); hazard ratio for untreated patients was 4.7 ($p < 0.001$). Among 29,921 patients older than 75 with Stage III/IV disease, 21.5% received only systemic treatment; 22.8% were entirely untreated.

Conclusion. 18% of EOC patients in the NCDB did not receive surgical treatment. These patients experienced significantly worsened survival. Prospective investigation is needed to determine how often apparent deviation from best-practices guidelines is clinically appropriate. Non-surgically treated patients may be at risk for poor access to gynecologic oncology care and deserve further study.

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1. Introduction

The standard of care for ovarian cancer includes surgical treatment as either primary or interval cytoreduction, except in cases where patients are poor surgical candidates, or disease is judged to be unresectable [1]. In all cases, to maximize the proportion of women who could benefit from the significant survival advantage that aggressive cytoreductive surgery confers, patients should be evaluated by a fellowship-trained gynecologic oncologist prior to being considered a poor surgical candidate [1]. Previous database analyses suggest that chemotherapeutic or surgical treatment patients receive is not consistent with best practice guidelines in 33–56% of cases [2,3]. With the exception of one single-institution study [4], little is known about whether deviations from guidelines are justified by patient- or disease-related factors.

We focus on a specific subset of women receiving guideline non-adherent care: women who did not receive surgical treatment in either the primary or interval cytoreductive settings. This population is particularly at risk for poor outcomes [5,6]. In some cases, triage to non-surgical care may reflect patients' preferences or reasonable

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Table 1
Descriptive characteristics.

	Surgery +/− systemic therapy (N = 172,687)	Systemic therapy only (N = 19,790)	No treatment (N = 18,190)	p-Value
Age at diagnosis (years), N (%)				
Mean (SD)	59.79 (14.05)	70.45 (12.39)	75.85 (12.56)	<0.001
Median (IQR)	60.00 (20.00)	72.00 (17.00)	79.00 (17.00)	<0.001
Age (years), N (%)				<0.001
<45	22,972 (13%)	646 (3.3%)	399 (2.2%)	
45–54	38,114 (22%)	1668 (8.4%)	998 (5.5%)	
55–64	44,973 (26%)	3478 (18%)	2013 (11%)	
65–74	38,481 (22%)	5359 (27%)	3250 (18%)	
75–84	23,968 (14%)	6496 (33%)	6162 (34%)	
≥85	4179 (2.4%)	2143 (11%)	5368 (30%)	
Patient race, N (%)				<0.001
White	152,326 (88%)	16,905 (85%)	15,389 (85%)	
Black	11,914 (6.9%)	2185 (11%)	2190 (12%)	
American Indian	511 (0.3%)	62 (0.3%)	34 (0.2%)	
Asian/Pacific Islander	4726 (2.7%)	375 (1.9%)	323 (1.8%)	
Other	1044 (0.6%)	82 (0.4%)	81 (0.4%)	
Unknown	2166 (1.3%)	181 (0.9%)	173 (1.0%)	
Hispanic ethnicity, N (%)				<0.001
No	151,008 (87%)	17,337 (88%)	16,004 (88%)	
Yes	8918 (5.2%)	945 (4.8%)	864 (4.7%)	
Unknown	12,761 (7.4%)	1508 (7.6%)	1322 (7.3%)	
Charlson-Deyo score[a], N (%)				<0.001
0	97,584 (57%)	10,136 (51%)	8783 (48%)	
1	17,061 (9.9%)	2752 (14%)	2980 (16%)	
2+	3677 (2.1%)	1104 (5.6%)	1600 (8.8%)	
Missing	54,365 (31%)	5798 (29%)	4827 (27%)	
Insurance coverage, N (%)				<0.001
Not insured	7249 (4.2%)	727 (3.7%)	732 (4.0%)	
Private insurance	89,568 (52%)	4864 (25%)	2930 (16%)	
Medicaid	9029 (5.2%)	1051 (5.3%)	813 (4.5%)	
Medicare	60,673 (35%)	12,560 (63%)	13,082 (72%)	
Other government	1419 (0.8%)	108 (0.5%)	64 (0.4%)	
Unknown	4749 (2.8%)	480 (2.4%)	569 (3.1%)	
Tumor grade, N (%)				<0.001
1	44,605 (26%)	1045 (5.3%)	705 (3.9%)	
2	75,527 (44%)	3994 (20%)	2360 (13%)	
3	15,036 (8.7%)	527 (2.7%)	296 (1.6%)	
Unknown	37,519 (22%)	14,224 (72%)	14,829 (82%)	
Tumor stage, N (%)				<0.001
1	41,693 (24%)	292 (1.5%)	512 (2.8%)	
2	15,321 (8.9%)	477 (2.4%)	577 (3.2%)	
3	72,527 (42%)	5084 (26%)	2724 (15%)	
4	30,485 (18%)	11,187 (57%)	8657 (48%)	
Unstaged/unknown	12,661 (7.3%)	2750 (14%)	5720 (31%)	
Tumor histology, N (%)				<0.001
NOS	16,962 (11%)	12,056 (64%)	13,251 (76%)	
Serous	88,184 (57%)	5823 (31%)	3279 (19%)	
Squamous	373 (0.2%)	16 (0.1%)	11 (0.1%)	
Mixed	5520 (3.6%)	87 (0.5%)	51 (0.3%)	
Carcinosarcoma	5630 (3.6%)	279 (1.5%)	186 (1.1%)	
Clear cell	9805 (6.3%)	156 (0.8%)	97 (0.6%)	
Mucinous	6579 (4.2%)	356 (1.9%)	328 (1.9%)	
Endometrioid	21,548 (14%)	192 (1.0%)	131 (0.8%)	
Sarcoma	458 (0.3%)	14 (0.1%)	39 (0.2%)	
Median income (quartile)[b] N (%)				<0.001
Q1 (lowest)	22,080 (13%)	3203 (16%)	3106 (17%)	
Q2	32,126 (19%)	4034 (20%)	3730 (21%)	
Q3	46,239 (27%)	5273 (27%)	4738 (26%)	
Q4 (highest)	65,611 (38%)	6425 (32%)	5879 (32%)	
Missing	6631 (3.8%)	855 (4.3%)	737 (4.1%)	
No high school degree (quartile)[b] N (%)				<0.001
Q1 (lowest)	25,486 (15%)	3514 (18%)	3277 (18%)	
Q2	37,881 (22%)	4798 (24%)	4466 (25%)	
Q3	45,056 (26%)	5105 (26%)	4768 (26%)	
Q4 (highest)	57,650 (33%)	5519 (28%)	4942 (27%)	
Missing	6614 (3.8%)	854 (4.3%)	737 (4.1%)	
Distance traveled to recording institution[b], N (%)				
Mean (SD)	33.28 (106.73)	24.56 (106.34)	21.23 (107.30)	<0.001
Median (IQR)	11.40 (25.40)	7.60 (16.20)	6.00 (10.70)	<0.001
Facility type, N (%)				<0.001
Community cancer program	11,075 (6.4%)	2423 (12%)	2860 (16%)	
Comprehensive community cancer program	88,555 (51%)	11,197 (57%)	10,902 (60%)	
Academic/research program	73,057 (42%)	6170 (31%)	4428 (24%)	
Annual hospital volume quartile, N (%)				<0.001
Q1 (lowest)	36,164 (21%)	8113 (41%)	8829 (49%)	

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