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Survival Outcomes in Epithelial Ovarian Cancer: The Role of the Ovarian Cancer-specific Comorbidity Index

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ABSTRACT

Aim: Epithelial ovarian cancer (EOC) is a gynecologic malignancy that is often diagnosed at an advanced stage and is associated with a high mortality rate. Comorbidities may significantly influence treatment planning and survival outcomes in these patients. This study aimed to evaluate the impact of comorbidity on survival in EOC patients using the Ovarian Cancer-Specific Comorbidity Index (OCCI).

Methods: This retrospective study included patients with newly diagnosed EOC. Demographic and clinical data, comorbidities, and treatment strategies were recorded. Patients were classified into low-, moderate-, and high-risk groups based on the OCCI, and the associations between progression-free survival (PFS) and overall survival (OS) were analyzed.

Results: Significant differences in survival were found among the risk groups. Taking the low-risk group as a reference, hazard raios (HRs) for PFS were 2.02 (p=0.002) in the moderate-risk group and 3.41 (p<0.001) in the high-risk group; for OS, HRs were 3.05 (p=0.001) and 5.63 (p<0.001), respectively. OCCI, Eastern Cooperative Oncology Group (ECOG) status, and the International Federation of Gynecology and Obstetrics (FIGO) stage were independent predictors of PFS. In contrast, OCCI, FIGO stage, and cytoreductive surgery were independent predictors of OS.

Conclusion: OCCI is a valuable tool for predicting survival and informing clinical decision-making in patients with EOC. The burden of comorbidities can significantly influence treatment choices and survival, particularly in elderly and advanced-stage patients. Incorporating OCCI into clinical practice may support the development of personalized and multidisciplinary treatment strategies, ultimately enhancing treatment outcomes.

Keywords: Epithelial ovarian cancer, Ovarian Cancer-Specific Comorbidity Index (OCCI), geriatric population, FIGO stage, ECOG performance status

Introduction

Ovarian cancer is among the most common gynecologic malignancies worldwide and remains the leading cause of gynecologic cancer-related mortality [1]. Approximately 95% of ovarian malignancies are epithelial ovarian cancers (EOC), for which the standard treatment approach includes cytoreductive surgery, platinum-based chemotherapy, and, in some instances, radiotherapy [2]. Despite advances in targeted therapies, long-term survival in EOC remains poor, with most patients experiencing recurrence within 15-18 months [3,4]. The disease primarily affects older adults with multiple comorbidities, further complicating treatment and prognosis [5].

Comorbidities-defined as the coexistence of additional physical or psychological conditions alongside a primary disease-are increasingly prevalent with advancing age and have a substantial impact on cancer treatment outcomes and tolerance, particularly in aggressive therapies like chemotherapy [6,7]. In EOC, where the majority of patients are elderly, comorbidities play a critical role in treatment decisions and prognosis [8,9]. However, there is no consensus on the optimal method for assessing comorbidity in oncology, and commonly used tools such as the Charlson Comorbidity Index, Elixhauser Comorbidity Index, National Cancer Institute Comorbidity Index, and Adult Comorbidity Evaluation-27 are not explicitly designed for cancer [10-14]. To address this gap, a study based on the Danish Gynecologic Cancer Database

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developed and validated the age-specific Ovarian Cancer Comorbidity Index (OCCI), which offers a practical and rapid means to stratify mortality risk in EOC patients [7]. Its utility has since been supported by secondary validation in a U.S. population [15].

Clarifying the role of comorbidities in EOC prognosis could enhance risk stratification and inform more personalized treatment approaches. Despite this, limited data exist regarding the prognostic utility of comorbidity indices, and no prior research has evaluated the clinical applicability of the OCCI within a Turkish patient population. Therefore, this study aimed to assess the impact of pre-chemotherapy comorbidity risk assessment using OCCI, on survival outcomes in newly diagnosed EOC patients.

Methods

This cohort study included patients diagnosed with EOC between January 2019 and January 2023 who were followed in the medical oncology department of our institution. Demographic data, clinical characteristics, comorbid conditions, treatment modalities, Eastern Cooperative Oncology Group (ECOG) performance status, histopathological subtypes, and International Federation of Gynecology and Obstetrics (FIGO) stages were retrospectively collected from patient files and digital hospital records. Additionally, treatment protocols (adjuvant, neoadjuvant, or palliative chemotherapy), surgical cytoreduction status, and treatment responses were analyzed. Patients were grouped based on whether they underwent surgery or not.

Due to the real-world design of the study, patients with varying disease stages and treatment intents were included. This includes early-stage patients undergoing curative surgery and stage 4 patients receiving palliative chemotherapy, which may introduce clinical heterogeneity.

The study was conducted in accordance with the principles of ethics. It was approved by the Non-Interventional Clinical Research Ethics Committee of the University of Health Sciences Türkiye, Dr. Abdurrahman Yurtaslan Ankara Oncology Training and Research Hospital (decision no: 2025-04/59, date: 17.04.2025). The ethics committee waived the requirement for informed consent due to the study's retrospective nature.

The study population consisted of patients aged 18 years or older with a new diagnosis of EOC, no prior systemic treatment, an evaluable ECOG performance status, and clinically adequate liver, renal, and cardiac function. The analysis included patients treated with a standard chemotherapy regimen administered every 21 days, comprising paclitaxel at a dose of 175 mg/m² and carboplatin (area under the curve 4-6) calculated according to creatinine clearance [16]. Demographic characteristics and comorbidity status before chemotherapy were used as the basis for analysis, and patients who received bevacizumab during chemotherapy or a poly (ADP-Ribose) polymerase (PARP) inhibitor as maintenance therapy were excluded. Patients who received bevacizumab during chemotherapy or PARP inhibitors as maintenance therapy were excluded from the study. This decision was based on the limited and inconsistent use of these agents during the study period, as well as the incomplete availability of data regarding maintenance treatments. Excluding these patients allowed for a more homogeneous cohort and minimized potential confounding effects arising from significant survival differences between patients receiving maintenance therapy and those who did not. Additional exclusion criteria were a history of another malignancy, incomplete diagnosis or comorbidity data, pregnancy or lactation, insufficient follow-up or loss of follow-up.

Evaluation of comorbidities was carried out using the OCCI, as proposed by Noer and colleagues. [7] This scoring system incorporates patient age and the presence of five specific comorbidities: hypertension, coronary artery disease, chronic obstructive pulmonary disease (COPD), diabetes mellitus, and dementia. The OCCI score for each patient was calculated using the following formula: $OCCI = \sum(RCi \times i)$

In this formula, *i* represents the presence (1) or absence (0) of each comorbidity, and *RCi* denotes the regression coefficient assigned to each comorbidity (Table 1).

Based on the total OCCI score, patients were stratified into low-, moderate-, and high-risk groups for subsequent analyses (Table 2).

Statistical Analysis

Categorical variables were summarized as counts and percentages. Based on the OCCI, patients were stratified into three risk categories: low, moderate, and high. Continuous variables were analyzed between groups using either the independent t-test or the Mann-Whitney U test, depending on data distribution. Categorical comparisons were performed using the chi-square or Fisher's exact test, as appropriate. Progression-free survival (PFS) was defined as the interval from the initiation of treatment to disease progression, death from any cause, or the date of last contact. Overall survival (OS) refers to the time from initial diagnosis to death or last follow-up. Survival analyses were performed using the Kaplan-Meier method, with comparisons between groups evaluated using the log-rank test. Variables identified as significant in univariate analyses were included in a Cox proportional hazards model to determine independent prognostic indicators. All statistical tests were two-tailed, with a significance threshold set at $p<0.05$. Analyses were conducted using International Business Machines Corporation (IBM) Statistical Package for the Social Sciences Statistics, version 25.0 (IBM Corp., Armonk, NY, USA).

Results

A total of 212 patients were included, with 33.0% categorized as low-risk, 47.2% as moderate-risk, and 19.8% as high-risk according to the OCCI. ECOG performance status differed significantly among groups ($p=0.013$); ECOG 0 was more common in moderate-risk patients, whereas ECOG 2 was more frequent in the high-risk group. FIGO stage distribution also varied significantly ($p<0.001$), with early-stage disease

(1-2) being more prevalent in low-risk patients, and stage 4 dominating the high-risk group. Cytoreductive surgery was more frequently performed in low-risk patients (76.1%) and less frequently in high-risk patients (20.0%) (p<0.001). Palliative chemotherapy was administered more often in the high-risk group (80.0%) compared to others (p<0.001). Other significant differences were observed in histologic subtypes, primary tumor site, and chemotherapy approach (Table 3).

Among the comorbid conditions, COPD (p=0.031) and dementia (p<0.001) showed statistically significant differences across OCCI risk groups. Both conditions were notably more prevalent in the high-risk group, with dementia observed in 20.0% and COPD in 23.8% of these patients. Other comorbidities such as hypertension, coronary artery disease, and diabetes mellitus did not differ significantly between groups (Table 4).

In PFS and OS analyses, univariate analysis revealed significantly worse outcomes in patients aged ≥65 years [PFS: hazard ratio (HR)=2.22, p<0.001; OS: HR=1.95, p<0.001]. However, no significant difference was found in multivariate analysis. According to risk stratification, the median PFS was 13.70 months in the low-risk group, 11.30 months in the moderate-risk group, and 7.92 months in the high-risk group (p<0.001, Figure 1).

Similarly, median OS was 49.20, 34.14, and 21.78 months, respectively (p<0.001, Figure 2). Multivariate analysis also showed significantly worse PFS and OS in the moderate- and high-risk groups (p<0.001).

In univariate analysis, patients with ECOG scores of 2 and 3 had significantly shorter PFS compared to those with ECOG scores of 0 (HR=2.89, p<0.001, and HR=2.77, p=0.023, respectively). However, no significant difference was found in ECOG performance status in the multivariate analysis. Increasing FIGO stage was associated with significantly worse PFS and OS in univariate analysis (p<0.001). However, in multivariate analysis, only OS remained significantly worse (p=0.018).

Patients receiving neoadjuvant or palliative chemotherapy had significantly shorter PFS and OS compared to those receiving adjuvant chemotherapy in univariate analysis (p<0.001). In multivariate analysis, PFS remained markedly worse in the palliative chemotherapy group (p=0.003) (Tables 5, 6).

Table 1. Variables and their corresponding weights derived from multivariate analysis for OCCI scoring

Comorbidity	RC (95% CI)
Hypertension	-0.29 (-0.43 to -0.15)
Coronary artery disease	0.46 (0.23 to 0.67)
Chronic obstructive pulmonary disease	0.56 (0.28 to 0.82)
Diabetes mellitus	0.40 (0.17 to 0.66)
Dementia	0.81 (0.34 to 1.28)

Regression coefficients adapted from Noer et al. [9].
OCCI: Ovarian cancer-specific comorbidity index, CI: Confidence interval, RC: Regression coefficient

Table 2. Cut-off values for OCCI risk stratification based on patient age groups

Age group	Low risk	Moderate risk	High risk
16-44 years	Score <1.21	1.21≤ score <3.64	Score ≥3.64
45-54 years	Score <0.28	0.28≤ score <1.74	Score ≥1.74
55-64 years	Score <-0.22	-0.22≤ score <1.12	Score ≥1.12
65-74 years	Score <-0.57	-0.57≤ score <0.53	Score ≥0.53
≥75 years	Score <-1.20	-1.20≤ score <-0.31	Score ≥-0.31

Age-stratified index scores from Noer et al. [9].
OCCI: Ovarian Cancer-Specific Comorbidity Index

Table 3. Comparison of demographic and clinical features across OCCI risk groups

Factor	Total n=212	Low risk n=70 (33.0%)	Moderate risk n=100 (47.2%)	High risk n=42 (19.8%)	p value
Age-year					0.417
<65	130 (61.3%)	40 (57.1%)	66 (66.0%)	24 (57.1%)	
≥65	82 (38.7%)	30 (42.9%)	34 (34.0%)	18 (42.9%)	
ECOG performance status					0.013*
0	62 (29.2%)	14 (20.0%)	34 (34.0%)	14 (33.3%)	
1	112 (52.8%)	44 (62.9%)	50 (50.0%)	18 (42.9%)	
2	32 (15.1%)	12 (17.1%)	10 (10.0%)	10 (23.8%)	

Table 3. Continued

Factor	Total n=212	Low risk n=70 (33.0%)	Moderate risk n=100 (47.2%)	High risk n=42 (19.8%)	p value
3	6 (2.8%)	0 (0.0%)	6 (6.0%)	0 (0.0%)	
FIGO stage					<0.001*
1	28 (13.2%)	20 (28.6%)	8 (8.0%)	0 (0.0%)	
2	26 (12.3%)	18 (25.7%)	8 (8.0%)	0 (0.0%)	
3	102 (48.1%)	26 (37.1%)	66 (66.0%)	10 (23.8%)	
4	56 (26.4%)	6 (8.6%)	18 (18.0%)	32 (76.2%)	
Histology					0.009*
High-grade serous	164 (77.4%)	58 (82.9%)	72 (72.0%)	34 (81.0%)	
Low-grade serous	10 (4.7%)	0 (0.0%)	6 (6.0%)	4 (9.5%)	
Endometrioid	16 (7.5%)	8 (11.4%)	8 (8.0%)	0 (0.0%)	
Clear cell	12 (5.7%)	2 (2.9%)	10 (10.0%)	0 (0.0%)	
Other or unknown	10 (4.7%)	2 (2.9%)	4 (4.0%)	4 (9.5%)	
Cytoreductive surgery					<0.001*
Yes	140 (66.0%)	70 (76.1%)	66 (66.0%)	4 (20.0%)	
No	72 (34.0%)	22 (23.9%)	34 (34.0%)	16 (80.0%)	
Primary site					0.020*
Ovarian carcinoma	174 (82.1%)	60 (85.7%)	82 (82.0%)	32 (76.2%)	
Primary peritoneal carcinoma	22 (10.4%)	8 (11.4%)	12 (12.0%)	2 (4.8%)	
Fallopian tube carcinoma	16 (7.5%)	2 (2.9%)	6 (6.0%)	8 (19.0%)	
Chemotherapy					<0.001*
Adjuvant	54 (25.5%)	26 (28.3%)	28 (28.0%)	0 (0.0%)	
Neoadjuvant	86 (40.6%)	44 (47.8%)	38 (38.0%)	4 (20.0%)	
Pallative	72 (34.0%)	22 (23.9%)	34 (34.0%)	16 (80.0%)	

*Significant.
OCCI: Ovarian Cancer-Specific Comorbidity Index, ECOG: Eastern Cooperative Oncology Group, FIGO: International Federation of Gynecology and Obstetrics

Table 4. Prevalence of selected comorbidities across OCCI-defined risk groups

Factor	Total n=212	Low risk n=70 (%)	Moderate risk n=100 (%)	High risk n=42 (%)	p value
Hypertension					0.162
Yes	86 (40.6%)	34 (37.0%)	40 (40.0%)	12 (60.0%)	
No	126 (59.4%)	58 (63.0%)	60 (60.0%)	8 (40.0%)	
Coronary artery disease					0.084
Yes	46 (21.7%)	16 (17.4%)	22 (22.0%)	8 (40.0%)	
No	166 (78.3%)	76 (82.6%)	78 (78.0%)	12 (60.0%)	
Chronic obstructive pulmonary disease					0.031*
Yes	26 (12.3%)	8 (11.4%)	8 (8.0%)	10 (23.8%)	
No	186 (87.7%)	62 (88.6%)	92 (92.0%)	32 (76.2%)	
Diabetes mellitus					0.129
Yes	52 (24.5%)	16 (22.9%)	30 (30.0%)	6 (14.3%)	
No	160 (75.5%)	54 (77.1%)	70 (70.0%)	36 (85.7%)	
Dementia					<0.001*
Yes	8 (3.8%)	4 (4.3%)	0 (0.0%)	4 (20.0%)	
No	204 (96.2%)	88 (95.7%)	100 (100.0%)	16 (80.0%)	

Table 4. Continued

Factor	Total n=212	Low risk n=70 (%)	Moderate risk n=100 (%)	High risk n=42 (%)	p value
Hypertension					0.162
Yes	86 (40.6%)	34 (37.0%)	40 (40.0%)	12 (60.0%)	
No	126 (59.4%)	58 (63.0%)	60 (60.0%)	8 (40.0%)	
Coronary artery disease					0.084
Yes	46 (21.7%)	16 (17.4%)	22 (22.0%)	8 (40.0%)	
No	166 (78.3%)	76 (82.6%)	78 (78.0%)	12 (60.0%)	
Chronic obstructive pulmonary disease					0.031*
Yes	26 (12.3%)	8 (11.4%)	8 (8.0%)	10 (23.8%)	
No	186 (87.7%)	62 (88.6%)	92 (92.0%)	32 (76.2%)	
Diabetes mellitus					0.129
Yes	52 (24.5%)	16 (22.9%)	30 (30.0%)	6 (14.3%)	
No	160 (75.5%)	54 (77.1%)	70 (70.0%)	36 (85.7%)	
Dementia					<0.001*
Yes	8 (3.8%)	4 (4.3%)	0 (0.0%)	4 (20.0%)	
No	204 (96.2%)	88 (95.7%)	100 (100.0%)	16 (80.0%)	

*Significant.
OCCI: Ovarian Cancer-Specific Comorbidity Index

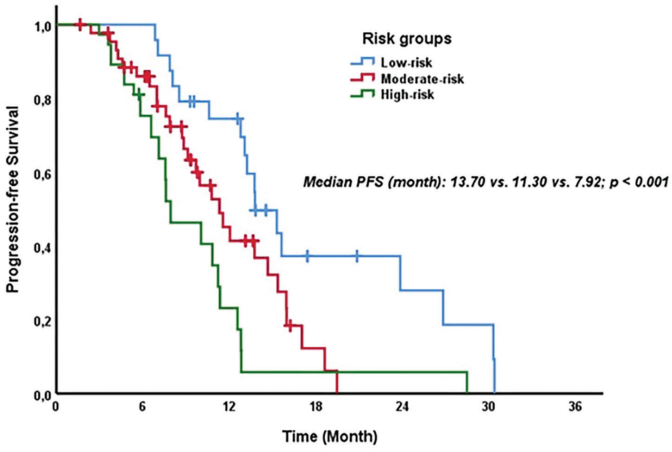

Figure 1. Kaplan-Meier curve of PFS according to risk groups of the ovarian cancer-specific comorbidity index
PFS: Progression-free survival

Time (months)	0	6	12	18	24	30
Low risk	70	67	41	17	9	2
Moderate risk	100	64	24	3	0	0
High risk	42	27	3	1	1	0

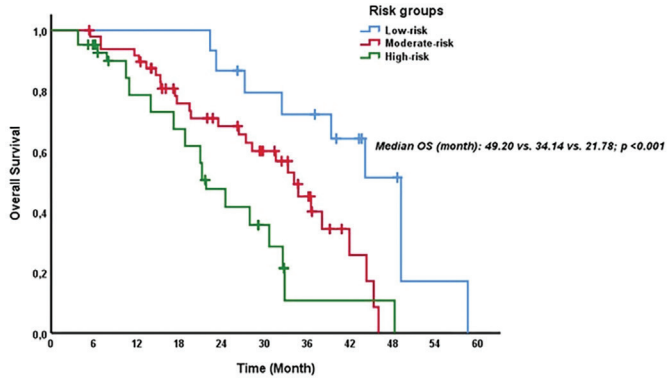

Figure 2. Kaplan-Meier curve of OS according to risk groups of the ovarian cancer-specific comorbidity index
OS: Overall survival

Time (months)	0	12	24	36	48	60
Low risk	70	70	60	47	19	0
Moderate risk	100	86	52	16	0	0
High risk	42	28	14	2	0	0

Table 5. Univariate analysis of progression-free survival and overall survival in patients with EOC

Factor	PFS	p value	OS	p value
	HR (95% CI)		HR (95% CI)	
Age-year				
<65	1		1	
≥65	2.22 (1.6-3.08)	<0.001*	1.95 (1.37-2.76)	<0.001*
Risk groups				
Low risk	1		1	
Moderate risk	2.02 (1.29-3.17)	0.002	3.05 (1.61-5.78)	0.001
High risk	3.41 (2.20-5.28)	<0.001*	5.63 (2.99-10.60)	<0.001*
ECOG performance status				
0	1		1	
1	1.43 (0.96-2.12)	0.077	1.06 (0.69-1.63)	0.791
2	2.89 (1.73-4.82)	<0.001*	1.93 (1.12-3.31)	0.017*
3	2.77 (1.15-6.70)	0.023*	3.53 (1.45-8.57)	0.005*
FIGO stage				
1	1		1	
2	6.01 (2.79-12.96)	<0.001*	2.48 (1.17-5.27)	0.018*
3	17.71 (8.34-37.63)	<0.001*	3.92 (2.09-7.34)	<0.001*
4	33.90 (15.12-76.02)	<0.001*	11.16 (5.45-22.84)	<0.001*
Histology				
High-grade serous	1		1	
Low-grade serous	2.82 (1.22-6.52)	0.015*	1.22 (0.53-2.79)	0.639
Endometrioid	1.12 (0.64-1.95)	0.700	0.97 (0.53-1.77)	0.911
Clear cell	1.58 (0.83-2.99)	0.164	0.75 (0.33-1.71)	0.490
Other or unknown	0.79 (0.38-1.64)	0.523	0.84 (0.41-1.76)	0.650
Cytoreductive surgery				
No	1		1	
Yes	0.36 (0.25-0.52)	<0.001*	0.40 (0.28-0.59)	<0.001*
Primary site				
Ovarian carcinoma	1		1	
Primary peritoneal carcinoma	0.91 (0.50-1.64)	0.749	0.87 (0.48-1.59)	0.658
Fallopian tube carcinoma	2.06 (1.08-3.95)	0.030*	1.77 (0.92-3.40)	0.090
Chemotherapy				
Adjuvant	1		1	
Neoadjuvant	6.19 (3.79-10.12)	<0.001*	2.52 (1.58-4.03)	<0.001*
Palliative	7.93 (4.84-12.99)	<0.001*	4.28 (2.60-7.02)	<0.001*

*Significant.
EOC: Epithelial ovarian cancer, PFS: Progression-free survival, OS: Overall survival, ECOG: Eastern Cooperative Oncology Group, FIGO: International Federation of Gynecology and Obstetrics, HR: Hazard ratio, CI: Confidence interval

Table 6. Multivariate analysis of progression-free survival and overall survival in patients with EOC

Factor	PFS	p value	OS	p value
	HR (95% CI)		HR (95% CI)	
Age-year				
<65	1		1	
≥65	0.47 (0.19-1.15)	0.098	0.82 (0.36-1.85)	0.635
Risk groups				
Low risk	1		1	
Moderate risk	3.17 (1.79-5.62)	<0.001*	2.55 (1.31-4.97)	0.006*
High risk	15.70 (5.35-46.13)	<0.001*	4.55 (1.67-12.39)	0.003*
ECOG performance status				
0	1		1	
1	1.55 (0.093-2.60)	0.092	0.74 (0.44-1.25)	0.255
2	1.98 (1.01-3.89)	0.047*	0.66 (0.34-1.28)	0.218
3	1.11 (0.40-3.07)	0.836	1.00 (0.39-2.59)	0.996
FIGO stage				
1	1		1	
2	3.49 (1.66-7.35)	0.001*	1.73 (0.77-3.86)	0.184
3	3.02 (1.12-8.18)	0.029*	3.36 (0.84-13.50)	0.087
4	6.16 (2.02-18.77)	0.001*	8.59 (1.97-37.54)	0.004*
Cytoreductive surgery				
No	1		1	
Yes	1.72 (0.58-5.09)	0.327	0.33 (0.13-0.83)	0.018*
Primary site				
Ovarian carcinoma	1		-	
Primary peritoneal carcinoma	0.56 (0.28-1.10)	0.091	-	
Fallopian tube carcinoma	2.34 (1.07-5.12)	0.034*	-	
Chemotherapy				
Adjuvant	1		1	
Neoadjuvant	1.98 (0.78-5.03)	0.151	0.67 (0.16-2.74)	0.577
Palliative	5.51 (1.79-16.94)	0.003*	0.27 (0.06-1.35)	0.111

*Significant.
EOC: Epithelial ovarian cancer, PFS: Progression-free survival, OS: Overall survival, ECOG: Eastern Cooperative Oncology Group, FIGO: International Federation of Gynecology and Obstetrics, CI: Confidence interval

Discussion

This study highlights the clinical relevance of the OCCI in chemotherapy-naive patients newly diagnosed with EOC. Our findings demonstrate that higher OCCI scores are significantly associated with poorer PFS and OS, especially among high-risk patients. Multivariate analyses identified OCCI, ECOG performance status, and FIGO stage as independent prognostic factors for PFS, while OCCI, FIGO stage, and cytoreductive surgery independently predicted OS. These results underscore the critical role of comorbidity burden in the management and prognosis of EOC.

Previous studies on the impact of comorbidities in EOC have yielded mixed results, possibly due to differences in study design, comorbidity indices used, and patient populations [8,17,18]. For instance, Minlikeeva et al. [8] found no significant impact of comorbidities on survival, possibly reflecting the inherently poor prognosis of EOC. Nonetheless, our findings support the importance of accurate comorbidity assessment, as demonstrated by the significant association between OCCI risk groups and survival outcomes. Retrospective analyses from Denmark also identified age, comorbidity, and FIGO stage as independent risk factors for mortality in gynecologic malignancies, emphasizing the need for personalized treatment in elderly patients with high comorbidity burdens [19]. Other studies confirmed comorbidity as an independent prognostic factor even after adjusting for tumor characteristics, with comorbid patients having a 1.31 to 1.50-fold higher risk of death [20-23]. Additionally, the age-adjusted Charlson Comorbidity Index has been shown to predict postoperative

complications and OS in advanced EOC [21], and several investigations have reported negative impacts of comorbidities on survival [22,23].

The prognostic influence of comorbidity extends beyond OS to cancer-specific mortality, especially in elderly populations, although the magnitude varies by cancer type [24]. Some studies highlight that comorbidities significantly affect treatment response and long-term survival, and serve as strong predictors of outcomes beyond their impact on postoperative complications [25]. Moreover, this effect cannot be fully explained by treatment selection or healthcare delays, suggesting the presence of complex underlying mechanisms [8]. Thus, thorough evaluation of patients' comorbidities is essential for clinical decision-making and preoperative risk stratification. The validation of OCCI in diverse populations further supports its applicability for international clinical use [7,15,17].

In our cohort, OCCI outperformed the Charlson Comorbidity Index in predicting survival outcomes, suggesting that disease-specific comorbidity tools may better guide risk assessment and treatment planning in EOC. Consistent with previous studies, including Vranes et al. [15] validation in a U.S. population, OCCI proved effective. Comorbidities influence treatment decisions, although some reports indicate that comorbidity does not significantly alter surgical choices, which are mainly driven by disease stage and performance status [19]. Our multivariate analyses reinforced advanced age and higher FIGO stage as significant prognostic factors alongside comorbidity scores, reflecting their established roles in disease aggressiveness and treatment limitations [26,27].

Regarding treatment modalities, cytoreductive surgery showed a significant positive effect on OS, aligning with established literature emphasizing its prognostic importance in EOC [28]. However, surgical planning for patients with substantial comorbidities requires caution due to increased perioperative risks, underscoring the necessity of multidisciplinary evaluation. While age was associated with survival in univariate analysis, this relationship did not persist in multivariate analysis, likely due to confounding by comorbidity prevalence and reduced treatment tolerance among elderly patients. This aligns with Danish data indicating increased median diagnosis age alongside rising comorbidity prevalence in EOC [22]. The well-established worsening of survival with advancing FIGO stage and the positive impact of cytoreductive surgery on OS observed in our study further validate these prognostic factors [7]. The pronounced survival decline in advanced-stage patients highlights the need for more intensive therapeutic strategies. Furthermore, the positive influence of successful cytoreduction supports its critical role in long-term outcomes.

Study Limitations

This study has several limitations. First, its retrospective design and single-center setting may lead to missing data, introduce selection bias, and limit the generalizability of the findings. Second, the inclusion of patients with markedly heterogeneous disease stages and treatment intents-ranging from early-stage patients undergoing primary surgery to *de novo* stage 4 patients receiving only palliative chemotherapy-may have introduced confounding effects that complicate the interpretation of survival outcomes. Third, patients treated with maintenance therapies such as anti-vascular endothelial growth factor agents or PARP inhibitors were excluded due to limited access and incomplete records. Although this exclusion may reduce the applicability of findings to contemporary clinical practice and potentially bias survival estimates, it also allowed for a more homogeneous study population by minimizing treatment-related variability. In addition, the proportional hazards assumption underlying the Cox regression models was not formally tested, which constitutes a methodological limitation that may affect the interpretation of hazard ratios over time. Finally, several important confounders-such as socioeconomic status, nutritional condition, and psychosocial factors-were not captured in the analysis, which could influence both comorbidity burden and clinical outcomes. Future prospective, multicenter studies that include broader patient characteristics and contemporary therapies are warranted to validate and expand upon these findings.

Conclusion

This study demonstrates that the OCCI is a valuable tool for prognostic assessment in patients newly diagnosed with EOC. The significantly lower survival rates observed in patients with higher comorbidity scores underscore the importance of carefully evaluating these individuals during treatment and follow-up planning. Incorporating the OCCI into clinical practice may contribute to optimizing both treatment responses and quality of life. In this context, the development of multidisciplinary approaches and personalized treatment strategies represents a crucial step toward improving outcomes in EOC care. Future research should focus on how the OCCI can inform treatment decisions, identify patients who may require more intensive therapy, and determine which specific comorbidities have the most significant prognostic value. Additionally, comparative studies are needed to evaluate the advantages and limitations of the OCCI relative to other comorbidity indices. These efforts may ultimately lead to more effective treatment strategies and improved survival outcomes for patients with EOC.

Ethics

Ethics Committee Approval: The study was conducted in accordance with the principles of ethics. It was approved by the Non-Interventional Clinical Research Ethics Committee of the University of Health Sciences Türkiye, Dr. Abdurrahman Yurtaslan Ankara Oncology Training and Research Hospital (decision no: 2025-04/59, date: 17.04.2025).

Informed Consent: Retrospective study.

Footnotes

Authorship Contributions

Surgical and Medical Practices: İ.K., Concept: İ.K., Design: İ.K., P.K., Data Collection or Processing: İ.K., P.K., Analysis or Interpretation: İ.K., Literature Search: K.D., Writing: İ.K., P.K.

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