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RESEARCH ARTICLE

Characteristics of Advanced Epithelial Ovarian Cancer Patients in Dr. M. Jamil Padang Hospital

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Abstract

Background: Ovarian cancer is a major global health concern, often diagnosed at advanced stages, impacting five-year survival rates. This study examines the demographic and clinical characteristics of 64 patients with advanced epithelial ovarian cancer, shedding light on the disease complexity.

Methods: Conducted at General Hospital Dr. M. Djamil Padang, this cross-sectional study analyzed patient data using SPSS. The research, approved by the Health Research Ethics Committee of Andalas University, included detailed demographic and clinical assessments.

Results: Predominantly, patients were aged 40-64, exhibited normal BMI, and a significant portion had not given birth. Evaluation of clinical factors, including Peritoneal Cancer Index (PCI) and residual tumor size, provided insights into the cohort's characteristics. Optimal cytoreduction (<1 cm residual tumor) was prevalent, emphasizing the role of surgery in enhancing survival.

Conclusion: The study underscores the multifaceted nature of advanced epithelial ovarian cancer and advocates personalized treatment approaches tailored to individual patient profiles. The findings contribute valuable insights to the existing knowledge, emphasizing the importance of age, BMI, and surgical interventions in influencing outcomes.

Keywords: Ovarian cancer, advanced epithelial ovarian cancer, demographic characteristics, clinical factors, optimal cytoreduction.

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INTRODUCTION

Globally, approximately 225,000 new cases of ovarian cancer are diagnosed each year, with a mortality rate of around 140,200 cases.[1] In the United States alone, about 22,280 new cases of ovarian cancer are identified annually, and the estimated number of deaths attributable to ovarian cancer in 2016 was approximately 14,240 cases.[2] In Indonesia, ovarian cancer ranks as the fourth most prevalent cancer based on estimated new cases at Dharmais Cancer Hospital in Jakarta from 2010 to 2013, following breast cancer, cervical cancer, and lung cancer.

Ovarian cancer is a significant global health concern due to its frequent diagnosis at advanced stages. Approximately 75% of ovarian cancer patients are identified at advanced stages, primarily because ovarian cancer often lacks distinctive clinical symptoms in the early stages, rendering patients prone to seeking treatment when the disease has progressed significantly. Discoveries made at advanced stages have a substantial impact on the five-year survival rates, which are less than 30%. Detecting ovarian cancer at an early stage has been demonstrated to enhance the five-year survival rates up to 90%. Consequently, numerous studies have been conducted to develop precise screening mechanisms for diagnosing ovarian cancer at an early stage, prior to the onset of clinical symptoms, thereby reducing the mortality rates among ovarian cancer patients.[3] Standard diagnostic examinations for women suspected of having advanced-stage ovarian cancer consist of clinical assessments based on performance status and physical examinations, ultrasonography, measurement of serum cancer antigen 125 (CA 125), and computed tomography (CT) or magnetic resonance imaging (MRI) scans. However, the ability of standard diagnostic examinations to accurately predict who may benefit from primary surgery remains low, resulting in 25% to 62% of primary surgeries with residual tumor deposits exceeding 1 cm in diameter.

Ovarian cancer is a significant global health concern due to its frequent identification at advanced stages. Approximately 75% of ovarian cancer patients are diagnosed at advanced stages, indicating the occurrence of metastasis. This is attributed to the often asymptomatic nature or lack of distinctive clinical symptoms of ovarian cancer in its early stages, leading patients to seek treatment when the disease has already advanced. Findings at advanced stages have a notable impact on the five-year survival rates, which are less than 30%. The identification of ovarian cancer at an early stage has proven to increase the five-year survival rates to 90%. Consequently, numerous studies have been conducted to develop precise screening mechanisms for diagnosing ovarian cancer at an early stage, before the emergence of clinical symptoms, thus reducing the mortality rates among ovarian cancer patients. Standard diagnostic examinations for women suspected of having advanced-stage ovarian cancer include clinical assessments based on performance status and physical examinations, ultrasonography, measurement of serum cancer antigen 125 (CA 125), and computed tomography (CT) or magnetic resonance imaging (MRI) scans. However, the ability of standard diagnostic examinations to accurately predict who may benefit from primary surgery remains low, resulting in 25% to 62% of primary surgeries with residual tumor deposits

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exceeding 1 cm in diameter. The resectability of metastatic tumors is usually determined by the location of the disease. Optimal cytoreduction is challenging in the presence of extensive disease on the diaphragm, in the liver parenchyma, along the base of the small intestine mesentery, in the lesser omentum, or in the porta hepatis.[4] However, the ability of standard diagnostic examinations to accurately predict who may benefit from primary surgery remains low, resulting in 25% to 62% of primary surgeries with residual tumor deposits exceeding 1 cm in diameter.[1]

The evaluation of the characteristics of advanced epithelial ovarian cancer patients is crucial for understanding the prognosis and treatment outcomes of this disease. Advanced epithelial ovarian cancer is a complex condition influenced by various factors such as age, BMI, parity, menopause status, peritoneal cancer index (PCI), and residual tumor size. Understanding the impact of these factors on the prognosis and treatment response is essential for improving patient care and outcomes. Several studies have highlighted the significance of evaluating these characteristics. For instance, emphasized the need for future research into the quality of life, experienced quality of care, and decision-making processes in patients with advanced epithelial ovarian cancer.[5] Additionally, reported non-significant impacts of age, BMI, tumor type, marital status, and parity on the prognosis of ovarian cancer, indicating the complexity of factors influencing the disease.[6] Furthermore, conducted a retrospective study to assess the prognostic significance of Log(CA125)/PCI for the resectability of epithelial ovarian cancer, shedding light on the importance of tumor characteristics in treatment decisions.[7] Moreover, highlighted the role of computed tomography in assessing tumor extent and the risk of residual disease after upfront surgery in advanced ovarian cancer, emphasizing the significance of imaging modalities in evaluating disease characteristics.[8] These studies collectively underscore the importance of evaluating the characteristics of advanced epithelial ovarian cancer patients to improve treatment strategies and patient outcomes.

METHODS

Study design and data collection

This observational analytical study uses a cross-sectional approach involved patients' medical reports, and all medical matters relating to this research are confidential. The study was conducted in General Hospital Dr. M. Djamil Padang, Obstetrics and Gynecology Department from January until December 2022. This study has been approved by the Health Research Ethics Committee of Andalas University (Approval number: 774/UN.162.KEP-FK/2021). The participants approved and signed the informed consent.

Statistical analysis

All data were collected and analyzed using a computer program SPSS (Statistical Package for the Social Sciences). In the descriptive analysis, categorical data were reported in frequency distribution and percentage and the data were assessed using Chi-square and Mann-Whitney tests.

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RESULTS AND DISCUSSION

Sixty four patients with advanced epithelial ovarian cancer visited the oncology and gynecology department at Dr. M Jamil Padang Hospital from January to December 2022 were observed in this study.

The demographic characteristics of the patients are shown in Table 1.

Table 1. Patient Demographics

Variables	n (64)	%
Age		
<19	1	1,6
19-39	14	21,9
40-64	37	57,8
>64	12	18,8
BMI (kg/m^2)		
<17	1	1,6
17-18.5	7	10,9
18.5-25	33	51,6
25-27	10	15,6
>27	13	20,3
Parity		
0	24	37,5
<3	17	26,6
3-5	16	25
>5	7	10,9
Menepause		
Yes	30	46,9
No	34	53,1

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PCI		
0	32	50
1	1	1,6
2	2	3,1
3	4	6,3
6	6	14,1
9	9	21,9
12	14	3,1
Residual tumor size (cm)		
<1	38	59,4
>1	26	40,6

The presented Table 1 outlines the distribution of study participants according to diverse demographic and clinical factors, providing a nuanced understanding of the sample composition. In terms of age, the majority of participants (57.8%) fell within the 40-64 age range, with notable representation from the 19-39 age group (21.9%). Participants under 19 years and those above 64 years constituted 1.6% and 18.8%, respectively. Body mass index (BMI) categories revealed a predominant presence in the 18.5-25 range (51.6%), followed by participants with BMI >27 (20.3%). Parity analysis indicated that a substantial portion of the sample (37.5%) had not undergone childbirth, while those with 0-3, 3-5, and >5 childbirths accounted for 26.6%, 25%, and 10.9%, respectively. Menopausal status varied, with 46.9% of participants in menopause and 53.1% not yet experiencing it.

Epithelial ovarian cancer is a condition associated with age-related factors and is considered a postmenopausal disease.[9] Several research reports indicate a more pronounced increase in the incidence of epithelial ovarian cancer in women above the age of 65.[10] However, in the present study, the percentage of patients aged above 65 is relatively low, accounting for 18%.

According to prior research, the average age at diagnosis ranges from 50 to 79 years.[11,12] Although the precise relationship between age and ovarian cancer outcomes remains uncertain, many researchers suggest that younger age in ovarian cancer patients is associated with better outcomes. However, previous studies have also indicated that age may not be a definitive prognostic factor.[13-15] Older age is more closely linked to advanced-stage disease and lower survival rates.[11,16] Furthermore, it has been reported that age above 64 years is one of the predictors of mortality in patients with ovarian cancer [17].

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Based on Body Mass Index (BMI), the respondents were predominantly within the range of 18.5-25 kg/m² (51.6%). These results indicate that the majority of subjects fall within the normal BMI range. According to a meta-analysis research report, conditions of overweight (BMI 25–29.9 kg/m²) and obesity (BMI ≥ 30 kg/m²) exhibit a tendency toward increased ovarian cancer incidence compared to individuals with a normal BMI.[18] Regarding parity, the majority of respondents had never given birth (37.5%). It has been reported that parity can also influence the occurrence of ovarian cancer.[19] A case-control study reported that a high number of childbirths is associated with a reduced risk of ovarian cancer incidence.[20] This finding aligns with the results of this study, where the lowest incidence of ovarian cancer occurred in subjects with a high number of childbirths. Concerning menopausal status, the majority of respondents had not experienced menopause (53.1%). Although the results of some studies suggest a relationship between early onset of menarche and ovarian cancer risk.[21,22] other researchers report that the age of menarche and menopause does not influence ovarian cancer risk.[23,24]

Continuing the examination of clinical factors, Table 1 also delineates the distribution of participants based on peritoneal cancer index (PCI) scores. A notable half of the participants (50%) had a PCI score of 0, while scores ranging from 1 to 12 were distributed across the remaining individuals. Furthermore, the categorization of residual tumor size highlighted that 59.4% of participants exhibited tumor sizes smaller than 1 cm, contrasting with 40.6% who displayed tumor sizes exceeding 1 cm. These findings collectively provide a comprehensive overview of the demographic and clinical profile of the study cohort, offering valuable insights into the distribution of key variables within the investigated population.

Based on the Peritoneal Cancer Index (PCI) scores, 50% of the patients were predominantly characterized by a PCI score of zero. The Peritoneal Cancer Index is reported to serve as a reliable predictor for achieving complete tumor resection during primary cytoreductive surgery in epithelial ovarian cancer.[25] Research conducted by Muallem et al. (2020) suggests that preoperative serum CA-125 levels >600 U/mL, PCI >20, and intraoperative ovarian cancer mapping scores >6 can be utilized to predict patients who will not achieve complete tumor resection. Furthermore, the combination of these three indicators can predict incomplete disease resection in a significant proportion of patients.[26] Based on residual tumor size, the majority of respondents had residual tumors <1 cm (59.4%). According to the definition, when the residual tumor is <1 cm, it is considered optimal cytoreduction. Residual tumor after cytoreduction and before chemotherapy is crucial for prognosis. It has been reported that patients undergoing optimal cytoreduction with residual tumor mass <1 cm have a 22-month longer survival compared to those undergoing suboptimal cytoreduction.[27] Optimal cytoreduction is also associated with chemotherapy sensitivity and enhanced survival. Previous studies have demonstrated that survival increases when the residual tumor is less than 1 cm.[28,29] A study by Bachman et al. (2021) using a CA-125 marker ≥ 500 U/mL also found a high proportion of patients undergoing optimal cytoreduction (<1 cm),

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accounting for 74.3%, compared to all patients undergoing suboptimal cytoreduction (25.7%).[30]

CONCLUSION

In conclusion, this study sheds light on the complex landscape of advanced epithelial ovarian cancer, emphasizing the significance of evaluating demographic and clinical characteristics for a comprehensive understanding of the disease. The demographic profile revealed a predominant occurrence of patients in the 40-64 age range, with a notable proportion falling within the normal BMI range and a substantial number having never given birth. The examination of clinical factors, such as the Peritoneal Cancer Index (PCI) and residual tumor size, provided insights into the distribution of key variables within the study cohort. The findings align with previous research highlighting the importance of age, BMI, and parity in influencing ovarian cancer outcomes. Moreover, the prevalence of optimal cytoreduction among patients with residual tumor sizes <1 cm underscores the crucial role of surgical interventions in enhancing survival rates. These results contribute valuable insights to the existing body of knowledge, emphasizing the multifaceted nature of advanced epithelial ovarian cancer and the need for personalized treatment strategies tailored to individual patient profiles. Further research is warranted to delve deeper into the intricate interplay of these factors and their implications for prognosis and treatment response.

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CONFLICT OF INTERESTS

The authors declare no conflicts of interests in preparing this article

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REFERENCES

1 Matulonis, U. A. *et al.* Ovarian cancer. *Nat Rev Dis Primers* **2**, 16061, doi:10.1038/nrdp.2016.61 (2016).
2 Siegel, R. L., Miller, K. D. & Jemal, A. Cancer statistics, 2016. *CA Cancer J Clin* **66**, 7-30, doi:10.3322/caac.21332 (2016).
3 Atallah, G. A., Abd Aziz, N. H., Teik, C. K., Shafiee, M. N. & Kampan, N. C. New Predictive Biomarkers for Ovarian Cancer. *Diagnostics (Basel)* **11**, doi:10.3390/diagnostics11030465 (2021).
4 Ri, K. Riset kesehatan dasar. *Jakarta: Badan Penelitian dan pengembangan Kesehatan Kementrian Kesehatan RI* (2013).
5 Zijlstra, M. *et al.* Treatment Patterns and Associated Factors in Patients With Advanced Epithelial Ovarian Cancer: A Population-Based Study. *International Journal of Gynecological Cancer*, doi:10.1136/ijgc-2019-000489 (2019).
6 Hussain, R. & Khaliq, S. Factors Linked With Prognosis in Epithelial Ovarian Cancer: A Study From Lahore, Pakistan. doi:10.53350/pjmhs2023171804 (2023).
7 He, C. *et al.* ≪p>Prognostic Significance of Log(CA125)/Pci for the Resectability of Epithelial Ovarian Cancer: A Retrospective Study</P&gt. *Cancer Management and Research*, doi:10.2147/cmar.s223519 (2020).
8 Asp, M. *et al.* The Role of Computed Tomography in the Assessment of Tumour Extent and the Risk of Residual Disease After Upfront Surgery in Advanced Ovarian Cancer (AOC). *Archives of Gynecology and Obstetrics*, doi:10.1007/s00404-022-06466-8 (2022).
9 Chornokur, G., Amankwah, E. K., Schildkraut, J. M. & Phelan, C. M. Global ovarian cancer health disparities. *Gynecol Oncol* **129**, 258-264, doi:10.1016/j.ygyno.2012.12.016 (2013).
10 Mohammadian, M. *et al.* Variations in the incidence and mortality of ovarian cancer and their relationship with the human development index in European Countries in 2012. *Biomedical Research and Therapy* **4**, 1541-1557 (2017).
11 Chan, J. K. *et al.* Ovarian cancer in younger vs older women: a population-based analysis. *Br J Cancer* **95**, 1314-1320, doi:10.1038/sj.bjc.6603457 (2006).
12 Zheng, G. *et al.* Familial risks of ovarian cancer by age at diagnosis, proband type and histology. *PLoS One* **13**, e0205000, doi:10.1371/journal.pone.0205000 (2018).
13 Chan, J. K. *et al.* Stages III and IV invasive epithelial ovarian carcinoma in younger versus older women: what prognostic factors are important? *Obstet Gynecol* **102**, 156-161, doi:10.1016/s0029-7844(03)00399-5 (2003).
14 Chan, J. K. *et al.* Differences in prognostic molecular markers between women over and under 45 years of age with advanced ovarian cancer. *Clin Cancer Res* **10**, 8538-8543, doi:10.1158/1078-0432.Ccr-04-0626 (2004).
15 Massi, D. *et al.* Epithelial ovarian tumors in the reproductive age group: age is not an independent prognostic factor. *Cancer* **77**, 1131-1136 (1996).
16 Poole, E. M. *et al.* Hormonal and reproductive risk factors for epithelial ovarian cancer by tumor aggressiveness. *Cancer Epidemiol Biomarkers Prev* **22**, 429-437, doi:10.1158/1055-9965.Epi-12-1183-t (2013).
17 Ørskov, M., Iachina, M., Guldberg, R., Mogensen, O. & Mertz Nørgård, B. Predictors of mortality within 1 year after primary ovarian cancer surgery: a nationwide cohort study. *BMJ Open* **6**, e010123, doi:10.1136/bmjopen-2015-010123 (2016).
18 Olsen, C. M. *et al.* Obesity and the risk of epithelial ovarian cancer: a systematic review and meta-analysis. *Eur J Cancer* **43**, 690-709, doi:10.1016/j.ejca.2006.11.010 (2007).
19 Momenimovahed, Z., Tiznobaik, A., Taheri, S. & Salehiniya, H. Ovarian cancer in the world: epidemiology and risk factors. *Int J Womens Health* **11**, 287-299, doi:10.2147/ijwh.S197604 (2019).
20 Risch, H. A., Marrett, L. D., Jain, M. & Howe, G. R. Differences in risk factors for epithelial ovarian cancer by histologic type. Results of a case-control study. *Am J Epidemiol* **144**, 363-372, doi:10.1093/oxfordjournals.aje.a008937 (1996).

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21 Fujita, M. *et al.* Smoking, earlier menarche and low parity as independent risk factors for gynecologic cancers in Japanese: a case-control study. *Tohoku J Exp Med* **216**, 297-307, doi:10.1620/tjem.216.297 (2008).
22 Jordan, S. J., Webb, P. M. & Green, A. l. C. Height, Age at Menarche, and Risk of Epithelial Ovarian Cancer. *Cancer Epidemiology, Biomarkers & Prevention* **14**, 2045-2048, doi:10.1158/1055-9965.Epi-05-0085 (2005).
23 Titus-Ernstoff, L. *et al.* Menstrual and reproductive factors in relation to ovarian cancer risk. *Br J Cancer* **84**, 714-721, doi:10.1054/bjoc.2000.1596 (2001).
24 Franceschi, S. *et al.* Pooled analysis of 3 European case-control studies of ovarian cancer: II. Age at menarche and at menopause. *Int J Cancer* **49**, 57-60, doi:10.1002/ijc.2910490111 (1991).
25 Lampe, B., Kroll, N., Piso, P., Forner, D. M. & Mallmann, P. Prognostic significance of Sugarbaker's peritoneal cancer index for the operability of ovarian carcinoma. *Int J Gynecol Cancer* **25**, 135-144, doi:10.1097/igc.0000000000000327 (2015).
26 Muallem, M. Z. *et al.* Pre-operative serum CA125, peritoneal cancer index and intra-operative mapping score as predictors of surgical results in primary epithelial ovarian cancer. *Int J Gynecol Cancer* **30**, 62-66, doi:10.1136/ijgc-2019-000778 (2020).
27 Holschneider, C. H. & Berek, J. S. Ovarian cancer: Epidemiology, biology, and prognostic factors. *Seminars in Surgical Oncology* **19**, 3-10, doi:https://doi.org/10.1002/1098-2388(200007/08)19:1<3::AID-SSU2>3.0.CO;2-S (2000).
28 Mousavi, A. S. *et al.* Can primary optimal cytoreduction be predicted in advanced epithelial ovarian cancer preoperatively? *World J Surg Oncol* **8**, 11, doi:10.1186/1477-7819-8-11 (2010).
29 Bristow, R. E., Tomacruz, R. S., Armstrong, D. K., Trimble, E. L. & Montz, F. J. Survival effect of maximal cytoreductive surgery for advanced ovarian carcinoma during the platinum era: a meta-analysis. *J Clin Oncol* **20**, 1248-1259, doi:10.1200/jco.2002.20.5.1248 (2002).
30 Bachmann, R. *et al.* Prognostic relevance of high pretreatment CA125 levels in primary serous ovarian cancer. *Mol Clin Oncol* **14**, 8, doi:10.3892/mco.2020.2170 (2021).