Research Article

Association Between Risk of Malnutrition and Surgical Outcome in Ovarian Cancer Patients

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Abstract

Ovarian cancer is the fourth most cancer in Indonesia. Treatment of ovarian cancer is surgery. Malnutrition may complicate healing, so studying the association between malnutrition and surgical outcome in ovarian cancer patients is necessary. A cross-sectional study was conducted in Dr. Cipto Mangunkusumo General Hospital from July 2018 - March 2019. fromo 63 patients underwent surgery, four were excluded due to non-malignant ovarian pathology results. Parameters assessed were characteristic subjects and risk factors of malnutrition in ovarian cancer patients. Malnutrition was assessed using the Patient-Generated Subjective Global Assessment (PG-SGA) and surgery factors assessed were the length of surgery, size of the tumor, and blood loss during surgery. The nutritional status was classified as well-nourished and malnourished. The receiver operating characteristic (ROC) curve is used to assess malnutrition, length of stay, size of the tumor, and blood loss during surgery. The result shows that the prevalence of malnutrition in ovarian cancer was 78% (moderate was 42.4% and severe was 35.6%), and the median length of stay was eight days. There is an association (chi-square test, $p<0.05$) between malnutrition and surgical outcome in ovarian cancer patients. Malnutrition is associated (chi-square test, $p<0.05$) with a length of stay and increased blood loss during surgery.
Keywords: *length of stay, malnutrition, ovarian cancer, surgical factor.*

Hubungan Risiko Malnutrisi dan Hasil Pembedahan pada Pasien Kanker Ovarium

Abstrak

Kanker ovarium merupakan kanker nomor 4 terbanyak di Indonesia. Terapi kanker ovarium adalah pembedahan. Malnutrisi dapat memperlambat proses penyembuhan sehingga perlu dilakukan penelitian tentang hubungan malnutrisi dan hasil operasi pada pasien kanker ovarium. Sebuah studi potong lintang dilakukan di RSCM pada bulan Juli 2018 - Maret 2019. Dari 63 pasien yang menjalani operasi, 4 pasien dieksklusi karena hasil pemeriksaan patologi tidak termasuk kanker ovarium. Parameter yang dinilai adalah karakteristik subjek dan faktor risiko malnutrisi pada pasien kanker ovarium. Malnutrisi dinilai menggunakan the Patient Generated Subjective Global Assesment (PG-SGA) sedangkan faktor pembedahan dinilai berdasarkan waktu pembedahan, ukuran tumor, dan perdarahan selama operasi. Status gizi diklasifikasikan menjadi malnutrisi dan tidak malnutrisi. Kurva receiver operating characteristic (ROC) digunakan untuk menilai malnutrisi, lama perawatan, ukuran tumor dan perdarahan selama operasi. Hasilnya menunjukkan bahwa prevalensi malnutrisi pada kanker ovarium adalah 78% (tingkat sedang 42,4% dan berat 35,6%) dan rerata waktu rawat yang dibutuhkan adalah 8 hari. Didapatkan hubungan (uji chi-square, $p<0,05$) antara malnutrisi dan hasil operasi pada pasien kanker ovarium. Malnutrisi berhubungan dengan lama perawatan dan peningkatan perdarahan selama operasi.
Kata kunci: *lama rawat inap, malnutrisi. kanker ovarium, faktor pembedahan.*

Introduction

In 2012, the incidence of cancer was 14,1 million cases with an 8,2 million death rate.[1] In 2018, the incidence increased to 18,1 million cases with an 9,6 million death rate. One out of 4 cancer cases in women in developing countries are gynecology cancer, with ovarian cancer being the second most common cancer.[2] The incidence of ovarian cancer was 7.1%, with 3.8% death rate.[3] Most patients come to seek medical treatment in complicated advanced stages due to the asymptomatic nature of the early-stage disease.

Ovarian cancer treatment is surgery, and the surgical result is related to malnutrition. Malnutrition is an insufficient nutrition state due to either inadequate food intake or food nutrient malabsorption. The most common problem in cancer patients is malnutrition which complicates 20% of cases.

Globally the prevalence of malnutrition in ovarian cancer increased to 67-70%.[4-7] This condition leads to immune and musculoskeletal system dysfunction and could worsen the survival rate and patient outcomes. Malnutrition also prolonged length of stay and surgery factors such as volume of blood loss and duration of surgery related to the complexity of cancer and corresponding to nutritional status. *In* Indonesia, the association between malnutrition and *surgical outcome in* ovarian cancer is unknown; therefore it is necessary to do the nutritional screening and early evaluation of malnutrition risk in ovarian cancer patients undergoing surgery to improve patients outcomes. The Purpose of this study was to determine prevalence of malnutrition ovarian cancer patients in Indonesia, especially in RSCM and to determine association between malnutrition and surgical outcome.

Methods

A cross-sectional study was done in dr. Cipto Mangunkusumo General Hospital (CMGH). The data was analyzed from CMGH medical record from July 2018 - March 2019. All ovarian cancer patients with anatomical pathology who underwent surgery were included in this study. Baseline characteristics were analyzed and compared, including length of surgery, length of stay, surgical complication, blood loss dan transfusion. Patients with histopathology results showed other than ovarian cancer and received more than five bags of PRC transfusions were excluded. The nutritional status was assessed using PG-SGA one day before surgery and the patient was categorized well-nourished and malnourished. ROC was used to find the cut-off of all variables and continued with a chi-square test using SPSS 22.0 to determine the association between malnutrition and surgical outcome.

Ethical clearance was from the ethical committee in Faculty of Medicine Universitas Indonesia with number 0537/UN2.F1/ETIK/2018.

Results

There were 63 ovarian cancer patients underwent surgery and four patients were excluded. The menopause patients were 52.2% and parous women were 64.4%. The majority of patients (61.1%) came to hospital in the early stage. Among 59 patients, 78% were malnourished and the average length of stay was eight days (Table 1). Duration of surgery, blood loss volume, tumour size were included as the surgery factors. The average duration of surgery was 285 minutes and 66,1% of patients were given blood transfusion with average 223 cc. One patient was complicated by a septic condition after surgery. The average tumor size was 20 cm in diameter and the blood loss volume was 600 cc (Table 1).

Table 1. Characteristics of the Subjects (n=59)

Characteristics	Frequency
Age, n (%)	
Pramenopause	28 (47.5)
Menopause	31 (52.5)
Parity, n (%)	
Nulipara	21 (35.6)
Parous	38 (64.4)
Stadium of cancer, n (%)	
I	29 (49.2)
II	7 (11.9)
III	21 (35.6)
IV	2 (3.3)
Nutritional status, n (%)	
Malnourished	46 (78)
Not malnourished	13 (22)
Length of stay (days)	8 (6-16)
Duration of surgery (minutes)	285 (60-420)
Blood loss volume (cc)	600 (50-1700)
Diameter of tumor (cm)	20 (4-44)
Surgery complication	
Septic	1 (1.6)
Blood transfusion	39 (66.1)
Volume of transfusion (cc)	223 (0-869)

Table 2 shows the association between malnourished patients with stadium of ovarian cancer, length of stay, diameter of tumor, and blood loss (chi-square test, p<0,05). Meanwhile, there is no association between malnutrition, surgery length, and complication (chi-square test, p>0,05).

Table 2. Association between Malnutrition and Surgical Outcome

Surgical Outcome	Malnourised		p
	Yes (n=46)	No (n=13)	
Stadium			
I	19	10	0.025
II	6	1	
III	19	2	
IV	2	0	
Length of stay	8.63 ± 2.43	7.23 ± 1.16	0.039
Surgery factors			
Length of surgery			
>375 minutes	2	2	0.208
<375 minutes	44	11	
Diameter of tumor			
>16.5 cm	32	5	0.050
<16.5 cm	14	8	
Volume of blood loss			
>375 cc	40	7	0.009
<375 cc	6	6	
Complication			
Yes	1	0	1.00
No	45	13	

Discussion

In this study, more than half of the subjects (52.2%) were in menopause state. This is consistent with some studies conducted before. The ovarian cancer increase in menopause women especially in patients older than 65 years old but decreasing in women who already had child before.[8] The latter contradicted with our findings where 64.4% of subjects were parous women; increasing risk 1,33-2 times fold in the incidence of epithelial type ovarian cancer in parous women.[9,10] Unfortunately our study could not explain further about this association.

Most of the subjects (61.1%) came to our hospital in early stage disease and this is a contradictary condition which is 75% patients came in advanced stage. This is reflecting improvement in medical technology which allowed early detection in pelvic mass cases suspected malignancy.[11,12]

We found prevalence of malnutrition was 78% and 42,3% with PG-SGA B that corresponded to moderate malnutrition. Even in the early stage we found 19 from 29 of patients with malnutrition. This condition consistent with study which found 70% cancer patients were malnourished and ovarian cancer was the second highest case. This could possibly caused by loss of appetite as seen in 76.3% of subjects particularly IL-6 that correlates with malnutrition.[13-15] It is also revealed that the subjects had a great risk of malnutrition even in the early stage of cancer. More than half of subjects were in malnourished condition and could be contributed by high prevalence of malnutrition in Indonesian population.[16,17]

Length of stay is one of the indicator to evaluate short term health care quality and patients well being during hospitalization. Prolonged length of stay would increase the needs of medical resources and costs, also short term morbidity and mortality.[18] One of the etiology is malnutrition and we found that severily malnourished patient had the longest length of stay. Prolonged length of stay associated with malnutrition. It was found that 95% advanced stage and 42% early stage ovarian cancer patients had prolonged length of stay.[19] This could be contributed by the needs of nutritional intervention to optimize patients condition and minimize the morbidity and post operative complication.[20,21]

There was association between diameter of tumor and volume of blood loss and the malnutrition was associated with diameter of tumor. This could be explained by the role of vascular endothelial growth factor (VEGF) in ovarian cancer that have a positive association with malnutrition. VEGF induced tumor growth by angiogenesis mechanism and has association with malnutrition and systemic inflammation in ovarian cancer patients.[22, 23] The angiogenesis process induced the growth of new blood vessels that could lead to increase volume of blood loss and risk of bleeding during surgery. This could explained the association between malnutrition with volume of blood loss.[24,25] Further studies should be done to determine whether age could be a bias factor in malnourished ovarian cancer patients who underwent surgery.

Conclusions

The prevalence of malnutrition in ovarian cancer in this study was 78%. There were associations between malnutrition and prolonged length of stay, diameter of tumor and volume of blood loss.

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