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ORIGINAL ARTICLE

Value of the Preoperative Prognostic Nutritional Index in Ovarian Cancer

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ABSTRACT

Background: Ovarian cancer is the most frequent type of gynecological cancer following malignancies of the cervix and uterus and has the greatest death rate among gynecological malignancies. Almost two thirds of the patients have extensive intra-abdominal illness, ascites and cachexia due to malnourishment. Furthermore, systemic inflammation is crucial for the development and advancement of cancer. Therefore, it is imperative to identify relative biomarkers to forecast treatment outcomes and prognosis.

Aim: To evaluate the importance of preoperative prognostic nutritional index (PNI) in ovarian cancer. To assess retrospectively association between preoperative Prognostic Nutritional Index and prognosis in patients with ovarian cancer, and to evaluate its important on disease free survival and overall survival.

Methods: This study retrospective cohort observational study was conducted at Medical Oncology Department, Faculty of Medicine, Zagazig University. The preoperative peripheral blood neutrophil count was computed as follows: 10 × serum albumin (g/dL) + 0.005 × total lymphocyte count (per mm3). Using the web application "Cutoff Finder," the ideal PNI cut off value for overall survival (OS) was determined.

Results:The 47.895 cutoff value discriminated patients into the high-PNI and low-PNI groups. There was significant difference between the two groups. A low preoperative PNI was associated with an advanced FIGO stage, CA125, ascites, residual of disease, body mass index and significant longer OS and progression free survival in patients with high-PNI.

Conclusions: Preoperative PNI can be used as a simple and useful marker for predicting chemotherapeutic response and survival prognosis in patients with Ovarian Cancer.

Keywords:preoperative, prognostic Nutritional Index, Ovarian Cancer.

INTRODUCTION

Due mostly to late-stage detection, ovarian cancer (OC) is the second most common gynecological cancer and the fifth most common cause of cancer-related death for women in the United States [1].

According to annual projections from the American Cancer Society, 13270 fatalities and 19710 new cases of ovarian cancer are predicted to come from the disease in 2023 [2].

The Population-Based Registry Program of Egypt 2008–2011 reports that the crude rate of ovarian cancer is 4.6, meaning that 4.12% of the population is affected by this disease. It is anticipated that the incidence

of ovarian cancer will climb significantly, accounting for a 260% increase from 2288 in 2013 to 5957 in 2050. The highest incidence was found in Upper Egypt (6.1%), at 6.1%. Middle and lower Egypt had lower rates (3.8% and 3.9%, respectively) [3].

Based on epidemiological studies, age, genetic predisposition, infertility therapies, and family history are recognized risk factors for ovarian cancer. It has been suggested that breastfeeding, pregnancy, and oral contraceptives are protective factors. The incidence of ovarian malignancies can be decreased by one-third to two-fifths by removing risk factors. The condition known as ovarian cancer is heterogeneous and is classified into histological subgroups that differ in terms of prognosis, treatment approach, and epidemiology [4]. Clear cell, transitional cell, endometrioid, serous, mucinous, and malignant Brennan tumors are the several types of ovarian cancer [5].

Ninety percent or more of all OC are of epithelial origin, while the remaining OC are not -epithelial. Three percent of epithelial OC are mucinous, while the remaining cells are not. Additionally, it is discovered that 70% of non-mucinous have serous, 10% have endometrioid, 10% have clear cell, and 5% have unidentified subtypes. Recent research has identified two distinct kinds of serous carcinomas: high grade and low grade. Non-epithelial malignancies are less invasive than epithelial cancers [6].

A person's nutritional status is crucial for the treatment of many illnesses, including cancer. There is little data on the connection between nutritional status and ending chemotherapy, despite the fact that it influences how long chemotherapy lasts. It is commonly known that nutritional therapies, when utilized as an adjuvant therapy, can improve the outcomes of cancer treatment. Additionally, peritoneal metastases are common in the majority of individuals with advanced ovarian cancer. This makes it simple to exacerbate symptoms such bloating, vomiting, loss of appetite, intestinal obstruction, and abdominal pain. It also causes food intake to drop and nutritional status to worsen [7].

When it was first created in 1984, the prognosis nutritional index (PNI) was intended to be used for risk assessment of problems following surgery. PNI has gained notice lately as a sign of a bad prognosis for individuals suffering from several types of solid malignancies [8].

The development and spread of tumors are significantly influenced by aberrant nutritional and immunologic conditions. The numerically-derived prognostic nutritional index (PNI) using the formula below: A cancer patient's nutritional and immunological status can be evaluated using 10 × serum albumin (g/dL) and 0.005 × total lymphocyte count (per mm3) in peripheral blood **[9].**

Three general categories can be used to categorize the first response of ovarian cancer to treatment with platinum: platinum-responsive, platinum-resistant, and platinum-refractory. These classifications are helpful are largely centered on therapeutic management of ovarian cancer on clinical data. The patients in the platinum-refractory category may be the easiest to understand as they exhibit progression during treatment and do not react to platinum-based therapy. In contrast, a remission lasting shorter than six months after chemotherapy is indicative of platinum resistance. Clinically, these individuals respond to treatment at first, but within six months after the final round, they relapse. There is a spectrum of response for patients who respond to platinum-based therapy initially, ranging from a little over six months to several years **[10].**

Our study's objectives were to determine the importance of the preoperative Prognostic Nutritional Index (PNI) in cases of ovarian cancer and the possible historical association between PNI, overall and progression-free survival.

METHODS

From January 2019 to December 2021, 72 patients with operable ovarian cancer were included in this observational retrospective cohort study, which was carried out at the medical oncology department of Zagazig University's faculty of medicine.

Inclusion criteria included female patients >18 years, pathologically and radiologically proven of ovarian cancer, operable ovarian cancer disease according to The American Joint Committee on Cancer claims that

(AJCC) and patients underwent neoadjuvant chemotherapy.

Exclusion criteria included incomplete data in file, patients in the early stages but refused surgery, patients planned for palliative chemotherapy or the best supportive care and patients suffering from malignancy other than ovarian cancer.

Procedures

Calculation of cut off point for prognostic nutritional index:

The optimal cut-point value:

The point at which there is little to no absolute difference between the sensitivity and specificity values and where they most closely resemble the area under the ROC curve is known as the ideal cut-point value **[11].**

Outcome Measurements and Follow-up

The following formula is used to generate peripheral blood samples with serum albumin (g/dL) and total lymphocyte count (per mm3) are used to calculate the prognosis nutritional index (PNI) of 10×+0.005× can provide insight into the nutritional and immunological condition of cancer patients **[9].**

Statistical Analysis

SPSS version 23 was used for data processing; data were verified, input, and examined. The present study's The following statistical methods were applied to the data analysis. The data were reported as mean + standard deviation (SD) for quantitative variables and as a number and a percentage for qualitative variables. The Kaplan-Meier method was used to create the survival curves, and the log-rank test was employed to compare them.

A helpful tool for assessing the sensitivity and specificity of quantitative diagnostic measures that divided patients into two categories is the ROC Curve (recriver operating characteristic).

RESULTS

The Median (Range) age was 57.5(31-77) years old, 26.4% had positive family history, 87.5% of the patients presented in FIGO phase III, 20.8% still had illness, all patients underwent chemotherapy with platinum and 92% of patients had platinum sensitivity (Table 1).

The mean of serum albumin was 3.89 ± 0.54, the mean of Total lymphocyte count was 2.07 ± 0.54, and the mean of Prognostic nutritional index (PNI) was 49.24 ± 7.01 (Table 2).

The median progression free survival 9.5(3-44) months, while median overall survival was 29.4(14.4-54). According to Prognosis of the patients 23(31.9%) were alive, 24 patients (33.3%) were Censored and 25 patients (34.7%) were dead (Table 3).

Regarding Prognostic Nutritional Index predicting overall survival > 25 months, AUC was 0.750, Cutoff value was 47.895, Sensitivity was 78.3% and Specificity was 84.0%. then patients divided into two group high (PNI≥47.895) and low PNI groups (< 47.895) (Figure 1).

There is a negative correlation between Prognostic Nutritional Index, body mass index and CA125. While there is significant positive association between platinum sensitivity and ascites. Prognostic nutritional index does not significantly correlate with patient status, age, or menopausal status and family history (Table 4).

There was a notable distinction between the two studied groups in terms of FIGO stages, CA125, Ascites, residual disease, body mass index, overall survival per month and progression free survival (Table 5).

Patients with PNI >47.895 showed significantly longer overall survival (OS) when compared to patients with PNI ≤47.895 (Figure 2).

Patients with PNI >47.895 showed significantly longer Mean progression free survival when compared to patients with PNI ≤47.895 (Figure 3).

Table (1): Patients characteristics in the studied group

	Studied Group No (72)
Age Mean± SD	56.94±9.71
Median (range)	57.5 (31 - 77)
Menopausal status	
Postmenopausal	63(87.5%)
Premenopausal	9(12.5%)
Body mass index Mean± SD	33.32±7.18
Median (range)	31.23 (21.15 - 56.29)
Family history	
YES	19(26.4%)
NO	53(73.6%)
FIGO stage	
Stage (I, II)	9(12.5%)
Stage III	63(87.5%)
CA125 Mean± SD	398.9±114.12
Median (range)	419 (196 - 608)
< 500	57(79%)
≥ 500	15(21%)
Ascites	
No	27(37.5%)
Mild	10(13.9%)
Moderate	25(34.7%)
Marked	10(13.9%)
Residual disease after surgery	
No	57(79.2%)
Yes	15(20.8%)
Platinum sensitivity	
Resistance	6(8%)
Sensitive	66(92%)

Table (2): Prognostic nutritional index (PNI) in the studied group

	Studied GroupNo (72)
Serum albumin (g/dL) Mean± SD	3.89 ± 0.54
Median (range)	3.88 (2.23 - 5.3)
Total lymphocyte count (per µL) Mean± SD	2.07 ± 0.54
Median (range)	2.02 (0.92 - 3.61)
Prognostic nutritional index (PNI) Mean± SD	49.24 ± 7.01
Median (range)	48.22 (29.7 – 62)

Table (3): Progression Free Survival (PFS), Overall Survival (OS) and the prognosis in the studied group

	Studied Group No (72)
Progression Free survival (PFS) (month) Mean± SD	14.44 ± 9.95
Median (range)	9.5 (3 - 44)
Overall Survival (OS) (month) Mean± SD	29.66± 9.69
Median (range)	29.4 (14.4 - 54)
	Studied GroupNo (72)
Prognosis	
Alive	23 (31.9%)
Censored	24 (33.3%)
Death	25 (34.7%)

Table (4): Correlation between Prognostic Nutritional Index (PNI) and patient characteristic in the studied group.

Correlations		
	PNI	
	r	p
Age	-0.070	0.560
Patient status (Married)	0.096	0.421
Menopausal status (post-menopausal)	0.023	0.848
Body mass index	**-0.613**	**<0.001**
Family history (Yes)	0.026	0.829
FIGO stage (I, II)	0.160	0.179
Stage III	0.57	**<0.001**
CA125	**-0.640**	**<0.001**
Ascites (Yes)	**0.566**	**<0.001**
Residual disease after surgery (Yes)	**0.397**	**<0.001**
Platinum sensitivity (Yes)	**0.262**	**0.026**

r= Pearson Correlation p value<0.05 statistically significant

Table (5): Relation between Prognostic Nutritional Index (PNI) and patient characteristic in the studied group

	PNI < 47.895 (n = 35)	PNI >= 47.895 (n = 37)	p
Age			0.622
< 57 years	15 (42.86%)	18 (48.65%)	
≥ 57 years	20 (57.14%)	19 (51.35%)	
FIGO stage			0.016
Stage (I, II)	1 (2.86%)	8 (21.62%)	
Stage III	34 (97.14%)	29 (78.38%)	

	PNI < 47.895 (n = 35)	PNI >= 47.895 (n = 37)	p
CA125			
< 500	7 (20.00%)	29 (78.38%)	<0.001
≥ 500	28 (80.00%)	8 (21.62%)	
Ascites			
No	21 (60.00%)	6 (16.22%)	
Mild	7 (20.00%)	3 (8.11%)	<0.001
Moderate	6 (17.14%)	19 (51.35%)	
Marked	1 (2.86%)	9 (24.32%)	
Residual disease			
Yes	3 (8.57%)	12 (32.43%)	0.013
No	32 (91.43%)	25 (67.57%)	
Platinum sensitivity			
Sensitive	30 (85.71%)	36 (97.30%)	0.076
Resistant	5 (14.29%)	1 (2.70%)	
BMI categories			
Normal wt(18.5-23.9)	1 (2.86%)	3 (8.11%)	0.025
Over weight(24-27.9)	7 (20.00%)	17 (45.95%)	
Obese(≥ 28)	27 (77.14%)	17 (45.95%)	
Overall survival per month	٣٢,٤٦(26.٩-37.٨)	٤٧,٢(٤٢,٩-51.6)	0.0001(S)
Progression free survival per month	22.5(17.8-27.2)	38.4(32.5- 44.2)	0.0٠1(S)

Overall survival is the length of time from either the date of diagnosis or the start of treatment for a disease.

Progression free survival is the length of time during and after the treatment of a disease.

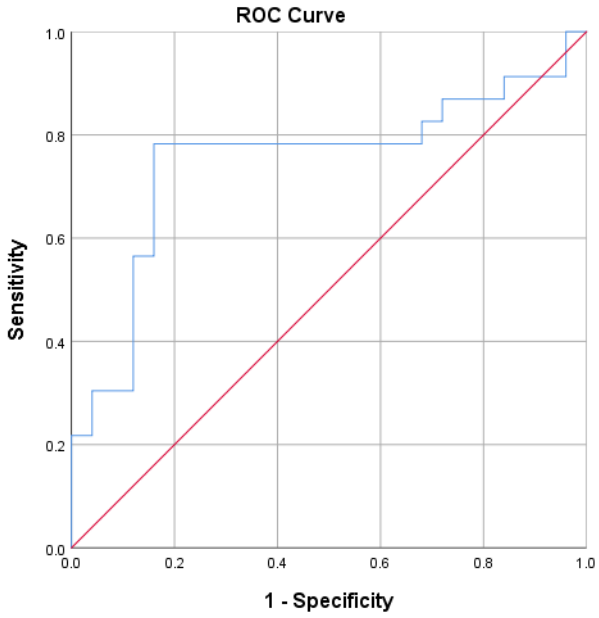

Fig (1): Receiver operating characteristic curve for Prognostic Nutritional Index to predict overall survival > 25 months.

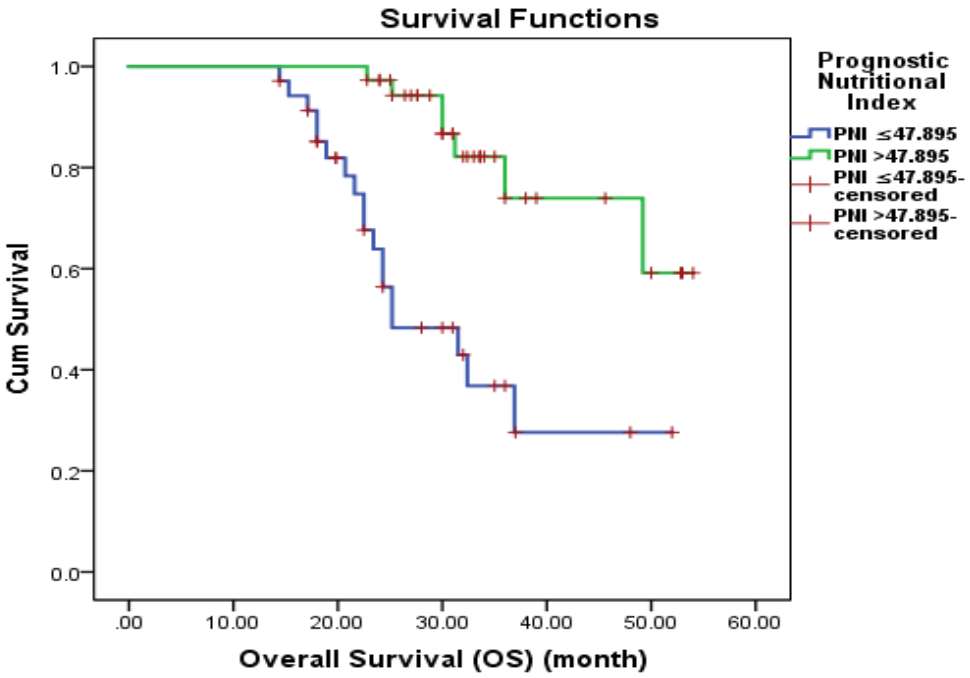

Fig (2): Kaplan-Meier method chart of Correlation between Prognostic Nutritional Index and Overall Survival.

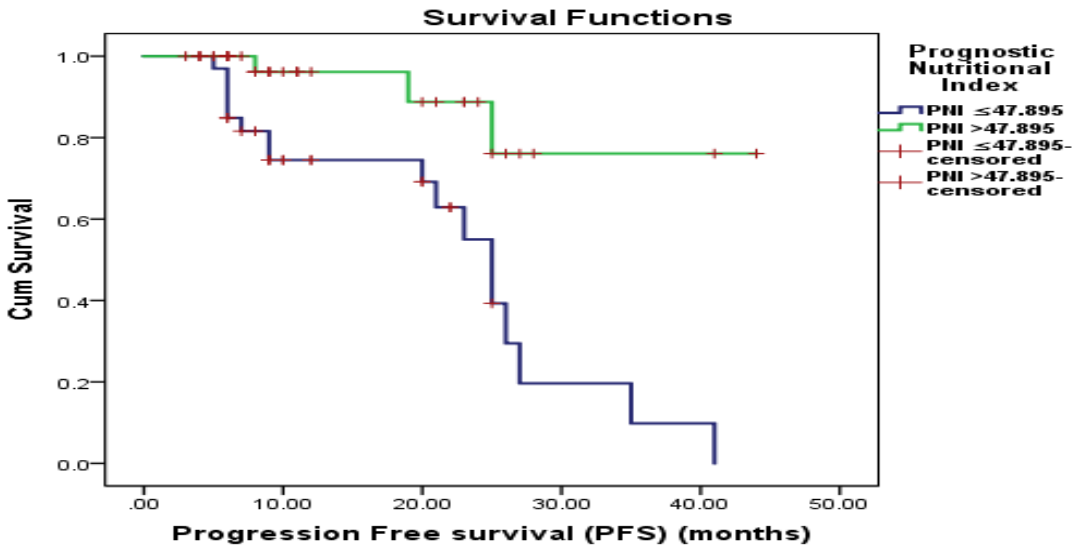

Fig (3): Kaplan-Meier method chart of Progression Free Survival according to PNI in ovarian cancer women.

DISCUSSION

Gynecologic cancer deaths are mostly caused by ovarian cancer (OC), which comes in seventh place among US women with cancer According to estimates, there would be 13,270 deaths and 19,710 new instances of OC in the US, with less than 40% of affected women expected to recover **[2].**

According to recent studies, pelvic inflammatory illness and hormone therapy may raise the risk of OC **[12, 13].**

Despite the fact that the majority of patients get chemotherapy after primary cytoreductive surgery, their prognosis is always poor due to advanced illness and strong treatment resistance. After receiving first-line chemotherapy, approximately 80% of OC

patients may develop tumors and experience recurrences within 1-2 years as a result of treatment resistance or therapeutic failure **[14].**

To our understanding, chemoresistance's mechanism is yet unknown. Understanding the connections between inflammation, metabolism, drug resistance, and cancer as well as identifying the best prognostic factor to use in predicting chemotherapy resistance and OC patients' survival remain significant clinical challenges **[15].**

Preoperative immunological and nutritional status, together with measures of the inflammatory response system, have been connected to the overall survival (OS) and postoperative prognosis of individuals with cancerous tumors **[16].**

The PNI, a unique prognostic factor that is efficient, straightforward, and convenient, is computed using the following formula: 0.005H lymphocyte count (per mm3) in peripheral blood plus serum albumin value (g/L). PNI has just been demonstrated to be a separate predictor of survival for a variety of malignant carcinomas, such as pancreatic, lung, colorectal, and stomach cancers **[17].**

In this study, the prognostic nutritional index and prognosis of patients with high-grade serous ovarian cancer were examined, along with the index's significance for overall and disease-free survival.

This observational retrospective cohort study was conducted at Medical Oncology Department, Faculty of Medicine, Zagazig University on 72 patients with ovarian cancer.

According to the current study, the median of age was 57.5 years old (range: 31-77 years). The BMI range for the patients was 31.23 (21.15±56.29), 87.5 percent of them were postmenopausal, and 26.4 percent had a positive family history while 73.6 percent had a negative one.

FIGO stage data showed that 63 patients (87.5%) were in stage III and 9 patients (12.5%) were in stages I and II and the mean of CA125 was 398.9±114.12, there was 57 patients (79%) had CA125 < 500, 15 patients (21%) had CA125 > 500**,** 27 patients (37.5%) had no ascites, 10 patients (13.9%) had mild ascites and 48.6% patients had moderate to marked ascites.

20.8% of the study population had residual disease after surgery, according to data on residual disease after surgery, whereas 79.2% of the study population had no residual disease after surgery.

Our results supported with**Feng et al. [18]** who aimed to investigate whether clinical features and prognosis in patients with high-grade serous ovarian cancer (HGSC) were associated with the prognostic nutritional score, an inflammatory-based prognostic score index (PNI). They retrospectively investigated 875 individuals who had debulking or primary staging procedures for HGSC in the past. The patients' age range (median) was 56 (30–90) years old. Over 90% of the patients (800/875) had advanced stages (III–IV). Patients were postmenopausal in 68.8% of cases, and had positive family history. While our results were not consistent with **Feng et al. [18] as** median (range) of Body Mass Index was 22.8(15.6-37.3), CA125 77.4% of patients were ≥500, ascites 72% of patients were >500ml and 68.9% following surgery and some patients still had residual disease. The disparity can be caused by the size of the study population.

As well, **Miao et al. [19]**we sought to examine how using the predictive nutritional index could help patients with epithelial ovarian cancer (EOC) receiving platinum-based chemotherapy respond to treatment and live longer (PNI) as a prognostic marker. 344 patients in all were enrolled. The patients' median age was 55 years old (range 45–84 years) and FIGO stage III (n = 126, 48.8%) at initial diagnosis.

All patients (100%) in this trial got a regimen of carboplatin plus paclitaxol. In terms of platinum sensitivity, 66 patients (92%) in our study met the criteria.

In contrary to our results **Zhang et al. [20]**we sought to determine the predictive significance of these variables, particularly with regard to stage, in predicting platinum resistance and survival in ovarian cancer (OC). 237 patients in all, with an OC diagnosis, had cytoreductivesurgery. Their age ranged from 24 to 76 years old, with a median of 50. At the time of diagnosis, these patients were categorized as stage III of the Federation of Gynecologists and Obstetricians

(FIGO) (n = 140, 59.1%), of which 106 (44.7%) were platinum-resistant and 131 (55.3%) were platinum-sensitive Also, not consistent with **Feng et al. [18]**They stated that 66.9% of them were platinum-sensitive, which the size of the study cohort may help to explain.

Overall Survival (OS) ranged from 14.4 to 54 with a median of 29.4 months, while Progression Free Survival (PFS) ranged from 3 to 44 with a median of 9.5 months. In contrary to our study **Zhang et al. [20]**considering that the majority of their patients were stage III, they showed that the median progression-free survival (PFS) and overall survival (OS) for the entire study group were 17 months and 36 months, respectively. In consistent with our study, the patients with low-PNI group had significantly shorter PFS (17.3 vs. 37.8 months, $P < 0.001$) and overall survival (OS) (38.7 vs. 68.8 months, $P < 0.001$) than those in the high-PNI group.

Serum albumin mean was 3.89 ± 0.54 and total lymphocyte count mean was 2.07 ± 0.54, and the median of Prognostic nutritional index (PNI) was 48.22 ranged from 29.7-62.

According to the results of the current investigation, the Prognostic Nutritional Index can predict overall survival > 25 months, AUC was 0.750, Cutoff value was 47.895, Sensitivity was 78.3% and Specificity was 84.0%.

Our result agreed with **Feng et al. [18]**who reported that The PNI had a median level of 46.2 and ranged from 29.2 to 67.7. As per the Cutoff Finder tool, a wide range of PNI cutoff values were significant when considering OS. Additionally, the optimal cutoff threshold for the PNI was 45.45. Following that, patients were split into high PNI ($PNI \geq 45.45$, $n = 472$, 54.5%) and low PNI groups ($PNI < 45.45$, $n = 394$, 45.5%).

According to prognosis, 23 patients (31.9%) were alive, 24 patients (33.3%) were Censored and 25 patients (34.7%) were dead. While **Feng et al. [18]**reported (29.4%) of patients were alive, (18.4) were censored and (52.2%) of patients were dead.

Our study revealed a strong negative link between the Prognostic Nutritional Index and progression and no significant correlation between overall survival or progression-free survival (months) and the Prognostic Nutritional Index, similar to what reported by **Zhang et al. [20].**

The results of the current investigation demonstrated a substantial relationship between FIGO stage III, body mass index, CA125, ascites, residual disease following surgery, and the Prognostic Nutritional Index. Prognostic Nutritional Index does not significantly correlate with age, patient state, menopausal status, or family history. **Miao et al. [19]**demonstrated that by drawing ROC curves for platinum-based chemotherapy outcome prediction, the optimal cut-off point for PNI was verified. The AUC, sensitivity, specificity, positive and negative predictive values, in predicting platinum resistance, and accuracy of PNI <45 were found to be: 0.688, 62.50%, 83.47%, 59.41%, 85.19%, and 77.62%, in that order.

Our results supported with **Zhang et al. [20]**They demonstrated that decreased PNI was significantly connected with advanced FIGO tumor stage ($P < 0.001$), maximal residual tumor ($P < 0.001$), malignant ascites ($P < 0.001$), cancer antigen (CA)-125 ≥ 35 U/ml ($P < 0.001$), and platinum resistance ($P < 0.001$). However, no significant correlations were discovered between PNI and age ($P = 0.066$) or body mass index (BMI) ($P = 0.460$). Reduced PNI was also substantially correlated with residual tumor mass ($P = 0.023$) in patients with tumor stage III, but not with platinum resistance ($P = 0.095$). The univariate analysis's findings showed a strong relationship between the FIGO tumor stage, residual tumor mass, big ascites, CA-125 level, chemosensitivity, BMI, PFS and OS. Furthermore, we evaluated the independent prognostic variables of multivariate Cox proportional hazards. In the multivariate Cox regression model, the FIGO tumor stage, residual tumor mass, platinum resistance, PNI, and BMI were significantly associated with PFS. Only FIGO tumor stage, platinum resistance and PNI were individually and substantially associated with reduced OS.

Our results supported with **Zhang et al. [20]**who shown that the FIGO tumor stage in OC patients was a separate prognostic factor.

Furthermore, Feng et al. [18]who found a

correlation between a low preoperative PNI, a more extensive ascites, a high CA125 level, an advanced FIGO stage, and ongoing sickness. In univariate analyses, a higher PNI was linked to an OS (p<0.001).

Comparable to **Miao et al. [19]** the information showed that PNI was the most trustworthy independent predictive factor for OC patient survival overall. A PNI < 47.2 was found to be linked with advanced FIGO tumor stage, maximum residual tumor, malignant ascites, and platinum resistance using the chi-square test.

As well, **Miao et al. [19]**revealed demonstrated the PNI was a separate predictor of PFS and may be useful in predicting the platinum resistance of ovarian cancer and OS in their group (AUC = 0.688). They showed that there was a significant relationship (p = 0.002, 0.001, 0.001, 0.001) between the FIGO stage, residual tumor, BMI, and CA125 and the PNI level. Moreover, **Feng et al. [18]**who came to the conclusion that preoperative PNI might reveal clinical outcomes by reflecting tumor burden. They stated that the PNI continued to be an independent predictor of OS in multivariate analysis.

This study showed that there was no statistically significant difference in age between the two groups under investigation (PNI < 47.895, and PNI ≥ 47.895) (p= 0.622). A noteworthy distinction (p=0.016) was observed in the FIGO stage of the two study groups. In CA125, there was a statistically significant difference between the two research groups. (p= <0.001). There was a significantly significant difference between the two study groups with regard to ascites (p= <0.001).

Our results supported with **Zhang et al. [20]**who proved that Age-related differences did not exist across the research groups. Otherwise, they claimed that the groups' FIGO stage, CA125, and ascites differed significantly from one another under study.

Moreover, **Feng et al. [18]**they concluded revealed the two study groups did not differ statistically significantly in terms of age.

Between the two study groups, there was a significant difference (p=0.013) in the illness residual. Between the two study groups, there was no statistically significant difference in platinum sensitivity (p=0.076). There was a significant difference in BMI categories (p=0.025) between the two study groups. Between the two study groups, there was a significant difference (p<0.0001) in the overall survival (OS) (month). Progression-free survival differed significantly between the two research groups (PFS) (months) (p= 0.001).

The median follow-up time was 18 (2 - 43) months. A total of 23 (31.9%) At the time of the latest follow-up, 25 (34.7%) of the patients were still living. whereas the data of 24 patients (33.3%) were suppressed.

As well, **Miao et al. [19]**who stated that 72 months was the follow-up period's median (range: 61-97 months). Our results supported with **Zhang et al. [20]**who stated that the sickness residuals differed significantly between the research groups. They did, however, see a substantial difference in BMI between the groups under observation. They discovered that PNI is more helpful than other prognostic markers of inflammation and nutrition in predicting survival in OC patients, particularly those with FIGO tumor stage III. Moreover, PNI may potentially be used to forecast how all-stage OC patients will respond to platinum-based chemotherapy.

Dai et al. [9] they discovered that in OC, shorter OS and PFS, as well as worse clinicopathological features, are all associated with lower preoperative PNI. A low preoperative PNI is a negative prognostic factor for patients with OC.

Mohri et al. [21] shown found PNI<45 was a significant predictor of poor survival in patients with colorectal cancer and an independent predictor of postoperative complications and worse survival.

In contrary to our study: **Komura et al. [8]** The authors of the study, which included 164 individuals with early-stage OC, could not find a statistically significant correlation between PFS and preoperative PNI (P =0 .58) and OS (P = 0.99).

Similarly, **Feng et al. [18]**did not use the multivariate analytic model to determine whether preoperative PNI and OS are related (P >0 .05).

CONCLUSION

Finally, we showed that The PNI is a distinct risk factor for poor PFS and OS in patients with OC. Regarding patients with EOC, the preoperative PNI provides a straightforward and practical marker for estimating the prognosis for survival and the response to chemotherapy.

REFERENCES

1. **Arora T, Mullangi S, Lekkala MR.** Ovarian Cancer. Jun 18. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023; Jan–. PMID: 33620837.
2. **Matsuo K, Matsuzaki S, Maeda M, Rau AR, Yoshihara K, Tamura R, et al.** Uptake and Outcomes of Neoadjuvant Chemotherapy Among US Patients with Less Common Epithelial Ovarian Carcinomas. JAMA Netw. Open, 2023; 6(6), e2318602-e2318602.
3. **Talaat A, Helmy MA, Saadawy SF.** Evaluation of miRNA-21 and CA-125 as a promising diagnostic biomarker in patients with ovarian cancer. Egypt. J. Med. Hum. Genet., 2022; 23(1), 1-7.
4. **Hu D, Ma D, Zhang ZJ, Zhang Y, Huang K, Li X.** Prognosis comparison between small cell carcinoma of ovary and high-grade serous ovarian cancer: A retrospective observational cohort study. Front Endocrinol, 2023; 14, 1103429.
5. **Hayashi T, Konishi I.** Molecular Histopathology for Establishing Diagnostic Method and Clinical Therapy for Ovarian Carcinoma. J. Clin. Med. Res., 2023; 15(2), 68.
6. **Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A.** Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018; 68(6):394–424.
7. **Nomoto N, Tate S, Arai M, Iizaka S, Mori C, Sakurai K.** Pretreatment Nutritional Status in Combination with Inflammation Affects Chemotherapy Interruption in Women with Ovarian, Fallopian Tube, and Peritoneal Cancer. Nutr., 2022; 14(23), 5183.
8. **Komura N, Mabuchi S, Yokoi E, Shimura K, Kawano M, Matsumoto Y, et al.** Prognostic significance of the pretreatment prognostic nutritional index in patients with epithelial ovarian cancer. Oncotarget, 2019; 10(38), 3605.
9. **Dai Y, Liu M, Lei L, Lu S.** Prognostic significance of preoperative prognostic nutritional index in ovarian cancer: a systematic review and meta-analysis. Medicine, 2020; 99(38), e21840.
10. **Chien J, Kuang R, Landen C, Shridhar V.** Platinum-sensitive recurrence in ovarian cancer: the role of tumor microenvironment. Front. oncol., 2013; 3, 251.
11. **Unal I.** Defining an optimal cut-point value in ROC analysis: an alternative approach. Comput. Math. Methods., 2017.
12. **Siegel RL, Miller KD, Jemal A.** Cancer statistics, 2018. CA: CA Cancer J Clin, 2018; 68(1), 7-30.
13. **Siegel RL, Miller KD, Fuchs HE, Jemal A.** Cancer statistics, 2021. Ca Cancer J Clin, 2021; 71(1), 7-33.
14. **Jayson GC., Kohn EC., Kitchener HC., et al.** Ovarian cancer. The Lancet, 2014, 384(9951), 1376-1388.
15. **Xishan Z, Ye Z, Feiyan M, Liang X, Shikai W**. The role of prognostic nutritional index for clinical outcomes of gastric cancer after total gastrectomy. Sci. Rep., 2020; 10(1), 17373.
16. **Pang, H., Zhang, W., Liang, X., Zhang, Z., Chen, X., Zhao, L, et al.** Prognostic score system using preoperative inflammatory, nutritional and tumor markers to predict prognosis for gastric cancer: a two-center cohort study. Advances in Therapy, 2021, 38(9), 4917-4934.
17. **Shao T., Verma HK., Pande B.** Physical activity and nutritional influence on immune function: an important strategy to improve immunity and health status. Frontiers in physiology, 2021, 12, 751374.
18. **Feng Z, Wen H, Ju X, Bi R, Chen X, Yang W, et al.** The preoperative prognostic nutritional index is a predictive and prognostic factor of high-grade serous ovarian cancer. BMC cancer, 2018; 18, 1-6.
19. **Miao Y., Li S., Yan Q., Li B.** Prognostic significance of preoperative prognostic nutritional index in epithelial ovarian cancer patients treated with platinum-based chemotherapy. Oncol Res Treat, 2016, 39(11), 712-719.
20. **Zhang W, Ye B, Liang W, Ren Y.** Preoperative prognostic nutritional index is a powerful predictor of prognosis in patients with stage III ovarian cancer. Sci. Rep., 2017; 7(1), 9548.
21. **Mohri Y, Inoue Y, Tanaka K, Hiro J, Uchida K, Kusunoki M**. Prognostic nutritional index predicts postoperative outcome in colorectal cancer. World J. Surg., 2013; 37(11), 2688-2692

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