Inflammatory and Nutritional Biomarkers in Patients With Esophageal Squamous Cell Carcinoma Undergoing Neoadjuvant Chemotherapy and Radiation Therapy

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OBJECTIVES: To investigate the relationship between pretreatment inflammatory and nutritional biomarkers in patients with esophageal squamous cell carcinoma (ESCC) undergoing neoadjuvant chemotherapy and radiation therapy (nCRT).

SAMPLE & SETTING: 213 patients with newly diagnosed stage II–III ESCC who received nCRT at an academic hospital in Taiwan.

METHODS & VARIABLES: Electronic health record data were used. Records on inflammatory and nutritional biomarkers and clinical outcomes were extracted. Logistic regression analysis was used to predict treatment-related adverse events, Cox regression was used for survival outcomes, and receiver operating characteristic curve analysis was used to determine optimal cutoff values.

RESULTS: There was a significant association between low prognostic nutritional index (PNI) and nCRT toxicities and survival. Advanced cancer stage, high platelet-to-lymphocyte ratio, and occurrence of pneumonia/infection were linked to survival outcomes.

IMPLICATIONS FOR NURSING: PNI shows promise in predicting prognosis, helps identify high-risk patients, and enables nurses to apply tailored interventions.

KEYWORDS esophageal squamous cell carcinoma; prognostic nutritional index; adverse events; survival

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Based on World Health Organization (2022) estimates, esophageal cancer is the seventh most frequently diagnosed malignant neoplasm and the sixth leading cause of cancer-related mortality worldwide. In 2023, about 21,560 cases were anticipated to be diagnosed, with 16,120 expected fatalities from this disease (Siegel et al., 2023). The pathologic subtypes of esophageal cancer exhibit distinct geographic distribution patterns. Esophageal squamous cell carcinoma (ESCC) is predominantly observed in East Asia, such as in Taiwan, and is particularly prominent in the Asian Esophageal Cancer Belt region on the world map; its prevalence is expected to rise because of increased tobacco smoking, betel nut chewing, and alcohol consumption (Chen, Chen, et al., 2022). The significant geographic and histologic variations in esophageal cancer incidence rates pose challenges in comprehending its pathophysiology and management. Surgery continues to be the primary treatment for early-stage esophageal cancer. Patients with stage I cancer typically undergo surgery alone or in combination with chemotherapy and radiation therapy (CRT) (Lagergren et al., 2017). For locally advanced ESCC, neoadjuvant CRT (nCRT) followed by surgery is the standard approach (Ajani et al., 2019; Muro et al., 2019). However, despite recent advancements in interprofessional interventions, the quality of life of patients with esophageal cancer remains substantially decreased, and the overall prognosis remains unfavorable, with a five-year survival rate of 30% (Sudo et al., 2021).

For resectable advanced esophageal cancer (stages II and III), nCRT is the predominant form of treatment