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Neutrophil-lymphocyte ratio is a predictor of venous thromboembolism in gastric cancer patients.

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Abstract

Background: The Neutrophil-lymphocyte Ratio (NLR) reflects the inflammatory state. Elevated NLR has been reported to be a prognostic indicator in some malignancies. The aim of this study was to determine whether NLR is a prognostic factor in the response to anticoagulation and survival in patients with gastric cancer and Venous Thromboembolism (VTE) treated with anti-VTE.

Methods: We retrospectively recruited 73 patients with gastric cancer who had VTE, among 539 patients with pathologically proven gastric cancer between January 2008 and December 2016. Univariate and multivariate analyses were performed to identify clinicopathological predictors of anticoagulant response and overall survival.

Results: Patients with high NLR had more late tumor stage (p=0.046), deeper tumor depth (p=0.033), and worse histologic grade (p=0.045) than did the low NLR group. There was a statistically significant association between poor NLR (p=0.001) and low albumin (p=0.016) and anticoagulant therapy. Multivariate analysis showed that high levels of NLR (hazard ratio, 1.56, 95% CI: 1.32-1.87, p=0.032) and late tumor stage (hazard ratio, 2.11, 95% CI: 1.29-3.44, p=0.043) were independent risk factors for poor prognosis for gastric cancer patients with VTE.

Conclusions: The results suggest that NLR may be a useful biomarker in predicting the response to anticoagulation and survival in patients with gastric cancer with VTE.

Keywords: Neutrophil-lymphocyte ratio, Gastric cancer, Venous thromboembolism.

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Introduction

Venous Thromboembolism (VTE), including deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE), is a common complication of cancer patients and is one of the major causes of morbidity and mortality [1,2]. Studies have shown that about 20% of patients who underwent VTE for the first time had cancer, and cancer patients had a 7-fold risk of developing VTE [3-5]. Gastric cancer is the fourth most common cancer in the world and the second most common cause of cancer-related death [6]. Recently, emerging studies have shown that VTE is relatively frequent in gastric cancer. The incidence of VTE in patients with gastric cancer was 3.5% to 24.4%, and VTE showed an adverse effect on the survival of cancer patients, even after adjustment for comorbidity [7,8]. The main mechanism of thrombosis in cancer patients is associated with abnormal vessel wall, blood flow and blood components [9]. In addition, inflammation is associated with prothrombotic state [10,11]. Inflammatory cells and mediators are an essential part of the tumor microenvironment [12].

Various biomarkers have been used to assess the inflammatory status of cancer patients. Among them, the neutrophil-lymphocyte ratio (NLR), which is a systemic inflammatory index, is an easily available and low-cost biomarker used in clinical practice, which has been associated with relapse [13,14] and survival [15-17] in various cancers. NLR has been reported to not only be of prognostic value in patients with gastric cancer, but also be a useful predictor of the depth of invasion of the gastric wall in these patients with gastric cancer [18]. Although NLR has been extensively studied in prognostic significance of cancer survival, [19-21] more and more studies have shown the clinical value between thrombosis and NLR, mainly in non-cancer patients [22]. However, there is currently no study of the association between NLR and cancer-related thrombosis. We therefore performed this study to assess the clinical impact of NLR on VTE diagnosis as a prognostic factor for anticoagulation and survival, as well as clinical features of patients with gastric cancer treated with anticoagulant VTE.