Preoperative Neutrophil To Lymphocyte Ratio In Advanced Gastric Cancer After Radical Resection: Propensity Score-matched Study

†aAlpha I. Balde MD ,MS,PhD,FWAMS; †aEnming Qiu, MD; bShaobiao Lin, MD; cZhe Zhu; aShuai Han MD, PhD, dYanfeng He MD; dWeiWei Feng, MD; aQianYun Chen , aNoman Shahid, aSidra Wafa, *aZhai Cai MD,PhD;*aZhou Li MD,PhD;
a Department of General Surgery, Zhujiang Hospital, Southern Medical University, Guangzhou, Guandong Province, Chinab Department of General Surgery, Huizhou No.6 Hospital, Huizhou, Guangdong Province , China
c The Second School of Clinical Medicine, Southern Medical University, Guangzhou, Chinad Department of General Surgery, YiWu FuYuan No.1 hospital, YiWu, Zhejiang Province, China

Introduction

Gastric cancer (GC) remains one of the leading causes of death in China, with a high morbidity of more than 400,000 patients per year [1]. The incidence is especially high in East Asia, with more than half of the worldwide morbidity occurring in China [2]. Despite the great efforts of medical authorities, more than 80% of Chinese patients arrive to receive medical attention at an advanced stage [3], and less than 20% of patients [4, 5] survive after 5 years.

Most studies showed discordance in the NLR. Values of (2-5) have been used in many studies. Yamanaka et al. [32] suggested an NLR value greater than 2.5 in gastric cancer (363 days vs. 239 days), while Varki [20] recommended an NLR value of 4.0. Moreover, Jung et al. [18] reported that an NLR value lower than 3 is associated with better outcomes of survival. Therefore, further prospective studies using the same threshold are warranted.

Here, we investigated the role of the NLR, OS and tumour recurrence after radical resection of AGC using propensity score matching.

Material and Methods

The present study is a multi-centre retrospective analysis of 348 gastric adenocarcinoma patients who underwent both open and laparoscopy-assisted gastrectomy (LAG) surgery with radical resection from 2012 to 2017 at three different institutions. However, only 253 patients met the study criteria and were enrolled in the present study. The following inclusion criteria were considered: gastric adenocarcinoma diagnosed via computed tomography (CT), patients diagnosed with GC and confirmed via pathology, and patients with or without lymph node metastasis. The following exclusion criteria were considered: transfusion within one month prior to surgery (n=20); bleeding, obstruction or perforation due to gastric cancer in emergency surgery (n=15); evidence of infection and history of inflammatory disease, including vasculitis, systemic lupus erythematosus (SLE), rheumatologic condition (n=15), history of preoperative anticancer chemotherapy or any cancer-related surgery (n=40); and history of steroid medication (n=5)..

The tumour was staged according the International Agency Cancer Classification for gastric cancer [33]. TNM stages IIb to IV (with resectable liver metastasis) of patients with primary gastrectomy were included in the present study. All of the patients underwent potentially curative radical resection with D2 lymphadenectomy. The present study was approved by the Ethics Committee of Zhujiang Hospital.

Figures

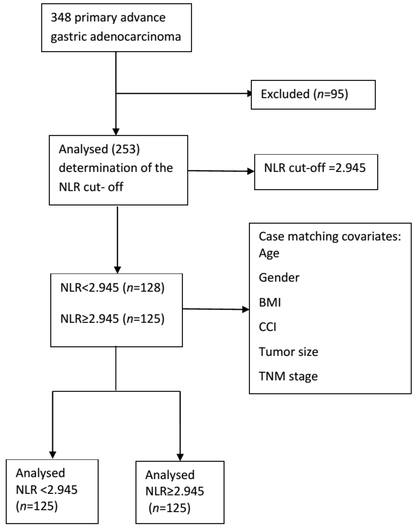


Fig. 1

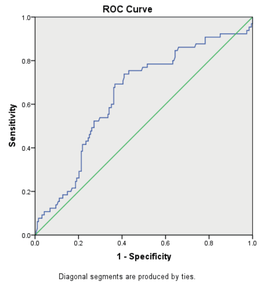


Fig. 2

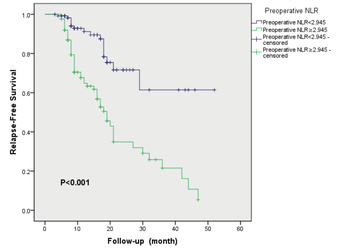


Fig. 3

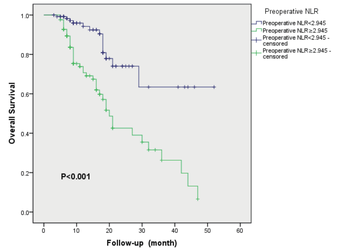


Fig. 4

Results

After PSM, there were no significant differences between groups in age, gender, American Society of Anesthesiologists (ASA) grade, tumour size, number of LNs retrieved, and TNM staging. The differences in tumour recurrence and serosal invasion were significantly different between the two groups (P<0.001 and P=0.049, respectively

[Table 2 about here]

Table 3 shows the multivariate analysis of the values selected from Table 2. The results show that recurrence (HR, 198.352; 95% CI, 17.933-2193.970; P<0.001) was the only independent risk factor related to survival.

[In addition, stage IIIB (HR, 2.161; 95% CI, 1.023-4.563; P=0.043) and a high perioperative NLR (≥2.945) (HR, 2.149; 95% CI, 1.360-3.395; P=0.001) were associated with vascular or neural invasion, as shown in Table 4.

Follow-up

After AGC resection, clinical assessments were conducted for an average of 13.38 (±9.07) months, and during this follow-up period, the OS (P<0.001) and RFS (P<0.001) were worse in the high perioperative group than in the low perioperative group between the two matched groups (Fig. 3 and Fig. 4).

Conclusion

In summary, the preoperative NLR in the peripheral blood was significantly associated with prognosis in AGC after radical resection, and as such, may be used to predict OS and RFS. However, numerous well-designed RCTs with the same threshold are needed to confirm the validity of these results.