



Relationship between Neutrophil-Lymphocyte Ratio and Clinicopathological Parameters in Follicular Lymphoma

Ceyda Aslan, Rafet Eren, Mehmet Hilmi Dođu, Osman Yokuş, Elif Suyanı

Abstract

Objective: We aimed to investigate the relationship between the neutrophil–lymphocyte ratio (NLR) and clinicopathological parameters during the diagnosis of follicular lymphoma (FL).

Methods: The data of 21 patients who were diagnosed with FL between December 2011 and May 2015 were retrospectively analyzed. The median NLR was 2.01 (range, 0.46–4.59), and the cut-off score for NLR was determined to be 2. NLR was >2 in 11 (52%) patients.

Results: No correlation was found between NLR and lactate dehydrogenase (LDH) levels; follicular lymphoma international prognostic index (FLIPI) score; disease stage; tumor grade; treatment necessity; presence of B symptoms; and presence of extranodal, bone marrow, hepatic, and splenic involvement ($p>0.05$).

Conclusion: We could not demonstrate a relation between NLR and clinicopathological parameters in FL patients. The retrospective nature of the study, small sample size, short follow-up period, and indolent nature of FL may be the reasons for these unexpected results.

Keywords: Neutrophil lymphocyte ratio, follicular lymphoma, prognostic factor

Introduction

The neutrophil–lymphocyte ratio (NLR), which is a cheap and easily available indicator of inflammation, has lately been demonstrated to be a prognostic factor of various solid malignancies as well as hematological malignancies such as diffuse large B-cell lymphoma (DLBCL), Hodgkin's lymphoma (HL), multiple myeloma (MM), and peripheral T-cell lymphoma (PTCL) (1–6). However, the relationship between NLR and clinicopathological parameters during the diagnosis of follicular lymphoma (FL) has not been investigated to date.

Methods

The data of 21 patients who were diagnosed with FL between December 2011 and May 2015 were retrospectively analyzed. The data, gathered from the medical records, including gender; age; lactate dehydrogenase (LDH) levels; presence of B symptoms; Ann Arbor stage; FLIPI score; extranodal, bone marrow, hepatic, and splenic involvements; tumor grade; treatment status; and follow-up period, were recorded. NLR was calculated on the basis of the complete blood count of patients prior to biopsy. The study protocol was approved by the local ethics committee.

The median age of the cohort was 57 years (range, 43–78), with 11 males and 10 females. Three (14.3%) patients had stage I–II disease and 18 (75.7%) had stage III–IV disease. The tumor characteristics were determined as grade 1–2 in 11 (52.4%) patients, grade 3A in 8 (38.1%), and grade 3B in 2 (9.5%). LDH levels were above normal in 12 (57.1%) patients. The median FLIPI score was 2 (range, 0–4). B symptoms were present in 7 (33.3%) patients. Extranodal involvement was observed in 9 (42.9%) patients. One (4.8%) patient presented with hepatic involvement, 6 (28.6%) with splenic involvement, and 8 (38.1%) with bone marrow involvement. Thirteen (62%) patients received treatment. During follow-up (range, 2–41 months), all the patients were alive. Only 1 patient who was treated progressed to aggressive disease. Therefore, we did not evaluate overall survival and progression-free survival of the cohort.

The median NLR was 2.01 (range, 0.46–4.59), and the cut-off score for NLR was determined to be 2. NLR was >2 in 11 (52%) patients. No correlation was found between NLR and LDH; FLIPI score; disease stage; tumor grade; treatment necessity; presence of B symptoms; and presence of extranodal, bone marrow, hepatic, and splenic involvement ($p>0.05$) (Table 1).

Discussion

There is increasing evidence that neutrophils, a constitutive member of cancer-related inflammation, contribute to tumor progression and metastasis (7, 8). On the contrary lymphocyte subtypes

Clinic of Hematology, İstanbul Training and Research Hospital, İstanbul, Türkiye

Address for Correspondence:
Rafet Eren
E-mail: drrafeteren@gmail.com

Received:
03.03.2016

Accepted:
26.07.2016

© Copyright 2016 by Available online at
www.istanbulmedicaljournal.org

Table 1. Descriptive characteristics and distribution of patients in relation to NLR

	NLR<2 n=10	NLR>2 n=11	p
Age, median, (range) years	53 (43-78)	57 (43-72)	0.756
Gender			
Male	6	4	0.67
Female	5	6	
LDH (U/L)			
=Normal	5	4	0.670
>Normal	5	7	
FLIPI score			
>2	4	3	0.659
<2	6	8	
Ann Arbor stage			
Localized	2	1	0.586
Advanced	8	10	
B symptoms			
Yes	2	5	0.361
No	8	6	
Extranodal involvement			
Yes	5	4	0.670
No	5	7	
Tumor grade			
1–2	7	4	0.194
3A	3	5	
3B	0	2	
Bone marrow involvement			
Yes	5	3	0.381
No	5	8	
Hepatic involvement			
Yes	1	0	0.476
No	9	11	
Splenic involvement			
Yes	3	3	1.000
No	7	8	
Treatment			
Yes	6	7	1.000
No	4	4	

FLIPI: follicular lymphoma international prognostic index; Hg: hemoglobin; LDH: lactate dehydrogenase; NLR: neutrophil-to-lymphocyte ratio

in the tumor microenvironment seem to be tumor suppressive (8). NLR, comprising these 2 entities, has not been studied in cases of FL to date. In the present study, we could not demonstrate a relation between NLR and clinicopathological parameters in FL patients, in contrast to other subtypes of NHL such as DLBCL, HL, and PTCL (2-6). The retrospective nature of the study, small sample size, short follow-up period, and indolent nature of FL may be the reasons for these unexpected results. In conclusion, studies encompassing a larger patient population and a longer follow-up period are needed to investigate this simple, potential prognostic tool extensively in cases of FL.

Ethics Committee Approval: Ethics committee approval was received for this study from local ethics committee.

Informed Consent: Written informed consent was not received due to the retrospective nature of this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - C.A.; Design - E.S.; Supervision - R.E.; Analysis and/or Interpretation - M.H.D., O.Y.; Literature Review - O.Y.; Writing - C.A.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

References

- Guthrie GJ, Charles KA, Roxburgh CS, Horgan PG, McMillan DC, Clarke SJ. The systemic inflammation-based neutrophil-lymphocyte ratio: experience in patients with cancer. *Crit Rev Oncol Hematol* 2013; 88: 218-30. [\[CrossRef\]](#)
- Keam B, Ha H, Kim TM, Jeon YK, Lee SH, Kim DW, et al. Neutrophil to lymphocyte ratio improves prognostic prediction of International Prognostic Index for patients with diffuse large B-cell lymphoma treated with rituximab, cyclophosphamide, doxorubicin, vincristine and prednisone. *Leuk Lymphoma* 2015; 56: 2032-8. [\[CrossRef\]](#)
- Porrata LF, Ristow K, Habermann T, Inwards DJ, Micallef IN, Markovic SN. Predicting survival for diffuse large B-cell lymphoma patients using baseline neutrophil/lymphocyte ratio. *Am J Hematol* 2010; 85: 896-9. [\[CrossRef\]](#)
- Koh YW, Kang HJ, Park C, Yoon DH, Kim S, Suh C, et al. Prognostic significance of the ratio of absolute neutrophil count to absolute lymphocyte count in classic Hodgkin lymphoma. *Am J Clin Pathol* 2012; 138: 846-54. [\[CrossRef\]](#)
- Kelkitli E, Atay H, Gilingir F, Güler N, Terzi Y, Ozatlı D, et al. Predicting survival for multiple myeloma patients using baseline neutrophil/lymphocyte ratio. *Ann Hematol* 2014; 93: 841-6. [\[CrossRef\]](#)
- Beltran BE, Aguilar C, Quiñones P, Morales D, Chavez JC, Sotomayor EM, et al. The neutrophil-to-lymphocyte ratio is an independent prognostic factor in patients with peripheral T-cell lymphoma, unspecified. *Leuk Lymphoma* 2016; 57: 58-62. [\[CrossRef\]](#)
- Swierczak A, Mouchemore KA, Hamilton JA, Anderson RL. Neutrophils: important contributors to tumor progression and metastasis. *Cancer Metastasis Rev* 2015; 34: 735-51. [\[CrossRef\]](#)
- Balkwill FR, Capasso M, Hagemann T. The tumor microenvironment at a glance. *J Cell Sci* 2012; 125: 5591-6. [\[CrossRef\]](#)