Revista Mexicana de Neurociencia

PERMANYER

Check for updates

EDITORIAL

Neutrophil to lymphocyte ratio and stroke. What should we know?

Fernando Barinagarrementeria

Department of Neurology, Hospital H+ de Queretaro, Queretaro, Mexico

Inflammation has been recognized as a key component in pathophysiology of stroke. More information are needed for detailed understanding of the role of systemic inflammation in acute stroke and in particular after reperfusion therapies. Recently, several serum biomarkers have been described the measure the intensity of inflammation.

Blood neutrophil-to-lymphocyte ratio (NLR) is a simple marker of subclinical inflammation that can be easily obtained from the differential white blood count[1]. The NLR has emerged in the past years as a prognostic marker in patients with cancer and coronary artery disease[2,3]. NLR is influenced by many conditions including age, race, and medication such as steroids, as well chronic conditions (e.g., diabetes)[4].

As mentioned before, ethnic differences in NLR have been reported, particularly between Asian and non-Asian population. In Mexico, the present study by Gomez-Piña and Hernández Amainari published in this issue of *Revista Mexicana de Neurociencias* is the first one to my knowledge to report NLR in a clinical series. In this work, the authors confirmed the prognostic role of NLR in stroke in Mexican population.

The normal range of NLR is in the range of 1-2 (0.8-2.2). The values above 3.0 and below 0.7 in adults are abnormal. NLR with values between 2.3 and 3.0 could be a warning regarding a pathological condition such as cancer, atherosclerosis, subclinical infection, or inflammation[5].

Regarding the role of NLR in stroke populations, there is growing evidence of their use as prognostic factor in several stroke categories such as ischemic and hemorrhagic stroke, prognosis in thrombolised patients, among other circumstances.

Tokgoz et al reported in a retrospective series of 255 patients with acute cerebral infarction that NLR was significantly increased in the mortality group versus the survival group (median 11.5 vs. 3.79)[6]. In an observational study included 855 consecutive patients with intracerebral patients, an elevated NLR (>4.66) was linked to unfavorable baseline clinical (NIHSS, and radiological parameters (larger hematoma volume) as well as increased risk of infectious complications as well association with higher mortality[7]. Another similar study was published by Lattanzi et al. in which NLR was directly and independently related to the risk of adverse 3-month outcome. In this study, the best predictive cutoff NLR value was 4.58[8].

Systemic inflammation has been related to severity of cerebral edema after reperfusion therapy in stroke[9]. Ferro et al. found an association between NLR and degree of cerebral edema after reperfusion therapy and was associated with poor functional status at 90 days (NRL > 7)[10]. The authors concluded that NLR convey early warning alerts for patients at risk of neurological complications after stroke.

Song et al. published recently a meta-analysis regarding the role of basal NRL and acute ischemic and

Correspondence:
Fernando Barinagarrementeria
E-mail: fbarinaga@icloud.com

Date of reception: 20-10-2022
Date of acceptance: 25-10-2022
DOI: 10.24875/RMN.M22000092

Available online: 02-12-2022
Rev Mex Neuroci. 2022;23(6):193-194
www.revmexneurociencia.com

hemorrhagic stroke[11]. Thirty-seven studies with 47,979 patients were included. Higher LRL levels were correlated with increased risk of ischemic stroke, unfavorable functional outcome at 3 months, and increase mortality in patients with ischemic stroke. Regarding hemorrhagic stroke high NLR affected negatively mortality. Li et al. published a systematic review and meta-analysis in which among 27,124 patients, elevated NRL was significantly associated with poor prognosis in stroke patients[12].

References

1. Zahorec R. Ratio to neutrophil to lymphocyte count-rapid and simple parameter of stress and systemic inflammation in critically ill. Bratisl Med J. 2002;102:5-14.
2. Walsh SR, Cook EJ, Goulder F, Justin TA, Keeling NJ. Neutrophil-lymphocite ratio as a prognostic factor in colorectal cancer. J Surg Oncol. 2005;91:181-4.
3. Tamhane UU, Aneja S, Montgomery D, Rogers EK, Eagle KA, Gurm HS. Association between admission neutrophil to lymphocyte ratio in patients with acute coronary syndrome. Am J Cardiol. 2008;102:653-7.
4. Fisher A, Srikusalanukul W, Fisher L, Smith P. The neutrophil to lymphocyte ratio on admission and short-term outcomes in othogeriatric patients. Int J Med Sci. 2016;13:588-602.
5. Zahorec R. Neutrophil-to-lymphocyte ratio, past, present and future perspectives. Bratisl Lek Listy. 2021;122:474-88.
6. Tokgoz S, Kayrak M, Akpinar Z, Sehithanoglu A, Guney F, Yuruten B. Neutrophil lymphocyte ratio as predictor of stroke. J Stroke Cerebrovasc Dis. 2013;22:1169-74.
7. Giede-Jeppe A, Bobinger T, Gerner ST, Sembill JA, Sprugel MI, Beuscher VD, et al. Neutrophil to lymphocyte ratio is an independent predictor for in-hospital mortality in spontaneous intracerebral hemorrhage. Cerebrovasc Dis. 2017;44:26-34.
8. Lattanzi S, Cagnetti C, Provinciali L, Silvestrini M. Neutophil-to-lymphocite ratio predicts the outcome of acute intracerebral hemorrhage. Stroke. 2016;47:1654-7.
9. Shi K, Tian DC, Li ZG, Ducruet AF, Lawton MT, Shi FD. Global brain inflammation in stroke. Lancet Neurol. 2019;18:1058-66.
10. Ferro D, Matias M, Neto J, Dias R, Morerira G, Petersen N, et al. Neeutrophil-to-lymphocite ratio predicts cerebral edema and clinical worsening early after reperfusion therapy in stroke. Stroke. 2021;52:859-67.
11. Song SY, Zhao XX, Rajah G, Hua C, Kang RJ, Hen YP, et al. Clinical significance of baseline neutrophil-to-lymphocite ratio in patients with ischemic stroke or hemorrhagic stroke: an updated meta-analysis. Front Neurol 2019;10:1032.
12. Li W, Hou M, Ding Z, Liu X, Shao Y, Li X. Prognostic value of neutrophil-yo-lymphocite ratio in stroke: A systematic review and meta-analysis. Front Neurol. 2021;12:686983.