



INFORMATIONAL SIGNIFICANCE OF THE INDEX OF THE RATIO OF NEUTROPHILS TO LYMPHOCYTES IN CRITICALLY ILL PATIENTS WITH ACUTE CEREBROVASCULAR ACCIDENTS

Yarashev A.R., Eshonov O.Sh.

Bukhara State Medical Institute. Uzbekistan

✓ Resume

The objects of the study were 62 patients, aged from 32 to 65 years (average age was 56.3 ± 3 years), in whom clinical (systemic parameters of hemodynamics and respiration, neurological status), instrumental (ECG, chest x-ray, MSCT examination of the brain) and laboratory data (leukoformula, index of the ratio of neutrophils to lymphocytes (INLR)). It was found that a high NLR rate is a reliable indicator of the clinical deterioration of the patient's condition and a predictor of an unfavorable outcome of critical conditions caused by stroke.

Key words: ischemic and hemorrhagic stroke, immune system, leukoformula.

O'TKIR BOSH MIYA QON-TOMIR AVARIYALARI BILAN OG'IR AHVOLDA BO'LGAN BEMORLARDA NEYTROFILLARNING LIMFOTSITLARGA NISBATI INDEKSINING AXBOROT AHAMIYATI

Yarashev A.R., Eshonov O.Sh.

Bukharo Davlat Tibbiyot Instituti. Uzbekiston

✓ Rezyume

Tadqiqot ob'ektlari 32 yoshdan 65 yoshgacha bo'lgan (o'rtacha yoshi $56,3 \pm 3$ yil) miya qon aylanishining o'tkir buzilishi bo'lgan 62 bemor bo'lib, ularda klinik (gemodinamikaning tizimli ko'rsatkichlari va nafas olish, nevrologik holat), instrumental (EKG, X) -ko'krak qafasi organlarining nurlari, miyaning MSCT tekshiruv) va laboratoriya ma'lumotlari (leykoformula, ISNL). Aniqlanishicha, ISNL ning yuqori darajasi bemorlarning ahvolining klinik yomonlashuvining ishonchli ko'rsatkichi va insult tufayli yuzaga kelgan og'ir sharoitlarning noqulay natijalarini bashorat qiladi.

Kalit so'zlar: ishemik va gemorragik insult, leykoformula immun tizimi.

ИНФОРМАЦИОННАЯ ЗНАЧИМОСТЬ ПОКАЗАТЕЛЯ СООТНОШЕНИЯ НЕЙТРОФИЛОВ К ЛИМФОЦИТАМ У БОЛЬНЫХ В КРИТИЧЕСКОМ СОСТОЯНИИ С ОСТРЫМИ КОНФЕРЕНЦИОННО-СОСУДИСТЫМИ НАРУШЕНИЯМИ

Ярашев А.Р., Эшонов О.Ш.

Бухарский государственный медицинский институт. Узбекистан

✓ Резюме

Объектами исследования явились 62 пациентов с острыми нарушениями мозгового кровообращения, в возрасте от 32 до 65 лет (средний возраст составлял $56,3 \pm 3$ лет), у которых были проанализированы клинические (системные показатели гемодинамики и дыхания, неврологический статус), инструментальные (ЭКГ, рентгенография органов грудной клетки, МСКТ исследование головного мозга) и лабораторные данные (лейкоформула, ИСНЛ). Установлено что высокий показатель ИСНЛ является достоверным показателем клинического ухудшения состояния пациентов и предиктором неблагоприятного исхода критических состояний вызванных ОНМК.

Ключевые слова: ишемический и геморрагический инсульт, лейкоформула иммунная система.

Relevance

It is known that in patients with stroke, the systemic immune response has peculiarities and is characterized by leukocytosis in combination with relative lymphopenia, deficiency of the T-cell link of the immune system [5,9] and activation of the humoral immune response with an increase in the content of B-lymphocytes in the blood (SB19 +, SB20 +), A, M, B and circulating immune complexes [2,5]. This fact allows us to say that the nature of changes in the immune status in acute cerebrovascular accident (ACVA) has the same directional vector, therefore, individual indicators of the immune status can be used in assessing the prognosis of the course and functional outcome of the disease.

The normal functioning of the immune system is one of the defining conditions for an adequate state of the physiological systems of the body. A decrease in the immunological reactivity of the population determines the characteristics of the formation, course and prognosis of diseases, including neurosurgical [8,12]. A decrease in the number of lymphocytes leads to a decrease in the body's resistance to pathogenic microorganisms and is an important manifestation of immunodeficiency in critically ill patients [1]. Immunological monitoring will make it possible to distinguish between rapidly changing phases of progressive inflammation and severe immunosuppression, which will help to improve the results of differentiated correction [4].

Today, clinical laboratory medicine has a huge number of methods for early and accurate diagnosis of a large number of diseases, dynamic control over the pathological process. Quantitative analysis of the leukocyte formula is an important research method that has diagnostic value in critical conditions. A thorough analysis of the leukoformula allows one to judge the course of the disease, the occurrence and severity of inflammatory manifestations and the effectiveness of the therapy [3]. Along with modern neuroimaging methods such as MSCT and MRI, successful therapy of critically ill patients with severe acute cerebrovascular accidents is based on laboratory parameters [7]. In order to objectify the assessment of these results, a number of indices have now been proposed that allow judging the course of the pathological process in the body, including the severity of inflammatory manifestations and the effectiveness of the therapy [11]. According to a number of authors, one of these indicators is the index of the ratio of neutrophils to lymphocytes (INLR) of the blood [6, 10].

Based on all of the above data, it can be argued that autoimmune inflammation in acute brain damage is one of the key factors that determine the further development and affect the outcome of the disease. But, despite numerous studies focused on this area of medicine, today there is no consensus and recommendations on the correction of the immune status in patients with acute brain damage. In this regard, this uncertainty determined the purpose of our study.

Purpose of the study: to determine the prognostic significance of INLR in predicting the outcome of critical conditions caused by stroke.

Materials and methods

The study was carried out in the neuroresuscitation department of the Bukhara branch of the RSCEMP. The objects of the study were 62 patients with acute cerebrovascular accidents, whose age ranged from 32 to 65 years (average age was 56.3 ± 3 years), in whom clinical and laboratory data were examined. There were 38 men (61.3%), women - 24 (38.7%). The overall mortality rate was 6 (9.6%). The study included patients with hemorrhagic ($n = 30$) and ischemic ($n = 32$) forms of stroke. Primary diagnosis was carried out on the basis of clinical and neurological data and the results of multislice computed tomography. When assessing neurostatus on the Glasgow Coma Scale (GCS), the mean score on admission to the hospital was 9.3 ± 2.1 . According to MSCT data, hemorrhagic stroke patients accounted for 51 hemorrhagic hematomas (82.3%), stem 6 (9.7%), ventricular 3 (4.8%), and subarachnoid 2 (3.2%). Ischemic foci were diagnosed in the basin: middle cerebral artery 48 (77.4%), anterior cerebral artery 3 (4.8%), posterior cerebral artery 4 (6.5%), and vertebrobasilar basin 7 (11.3%).

All patients received conservative treatment, including antibacterial, decongestant, membrane stabilizing, hemorheological, cerebroprotective and symptomatic therapy. If necessary (coma and in the presence of signs of dislocation of midline structures on MSCT), the patients were transferred to mechanical ventilation. 14 patients, which amounted to 22.6% (with hemorrhagic ($n = 9$ (64.2%)) and ischemic ($n = 5$ (35.8%))), were on prolonged mechanical lung ventilation. Ventilation modes and parameters were selected inductively according to the severity somatic status and anthropometric parameters. We analyzed clinical (systemic parameters of hemodynamics and respiration, neurological status), instrumental (ECG, chest x-ray, MSCT examination of the brain) and laboratory data (leukoformula, INLR). Comparison of clinical and laboratory parameters was carried out in three stages: the first stage - upon admission, the second stage: - 3rd day, the third stage - 7th day of intensive therapy.

Result and discussion

When analyzing the obtained data of the neurological status, it was revealed that upon admission in all examined patients the level of consciousness according to the GCS was from 8 to 12 points (8 points $n = 12$, 9 points $n = 15$, 10 points $n = 13$, 11 points $n = 8$, 12 points $n = 14$). Analysis of leukoformula indicators of these patients showed that the average INLR was equal to 2.2 ± 0.64 . At the 2nd stage of the study, there was an increase in the number of patients with a deeper impairment of neurostatus (according to the GCS: 8

14, 9 points n = 18, 10 points n = 14, 11 points n = 10, 12 points n = 6). This deterioration in neurological status was most likely associated with an increase in cerebral edema. These changes were confirmed by neuroimaging, where the increase in cerebral edema was evidenced by the flattening of the furrows, narrowing of the basal cisterns and ventricles of the brain. In these patients, clinical data of the progression of cerebral edema appeared as arterial hypertension, a tendency to bradycardia, tachypnea and anxiety. In this regard, 14 patients were transferred to mechanical ventilation. In this category of patients, when analyzing the leukoformula, an increase in the number of segmented neutrophils and a decrease in the number of lymphocytes, respectively, an increase in their ratio index (more than 3.8) were noted.

In dynamics against the background of intensive therapy, 56 patients showed clinical improvement, which was confirmed by the obtained data of the neurostatus of the 3rd stage of the study (according to GCS: 8 points n = 8, 9 points n = 10, 10 points n = 15, 11 points n = 19, 12 points n = 10). During the MSCT study, a regression of the previous picture of cerebral edema was noted: smooth furrows, narrowing of the basal cisterns and ventricles of the brain were absent. Patients who were on mechanical ventilation easily adapted to respirators and respiratory support stopped earlier in intensive care. In these patients, there was a gradual decrease in the INLR index below 2.1.

Of all examined patients, death was observed in 6 (2 patients with ischemic and 4 patients with hemorrhagic stroke). The analysis of the data obtained revealed a significant correlation between the leukoformula and overall mortality rates among patients with both nosologies. These patients showed a progressive increase in the average ISNL in both groups compared with the first stage (2.21 ± 0.62 , 4.15 ± 0.74 , 5.34 ± 0.52), ($p < 0.05$).

Conclusion

A higher INLR rate is a reliable indicator of clinical deterioration in patients' condition and a predictor of an unfavorable outcome of critical conditions caused by stroke. According to the results of the study, it can be assumed that careful observation of changes in the leukoformula makes it possible to predict the course and outcome of stroke. Timely response to changes, prevents possible deterioration of the condition and correct the ongoing therapy.

LIST OF REFERENCES:

1. Adrie C., Lugosi M., Sonnevile R., Souweine B., Ruckly S., Cartier J.C., Garrouste-Orgeas M., Schwebel C., Timsit J.F. OUTCOMEREA study group. Persistent lymphopenia is a risk factor for ICU-acquired infections and for death in ICU patients with sustained hypotension at admission. //Annals of Intensive Care. 2017; 7: 30. DOI: 10.1186/s13613-017-0242-0.
2. Borshchikova T.I., Epifantseva N.N., Churlyayev Yu.A. et al. Functional profile of cytokines and immunological dysfunction in neuroresuscitation patients // Cytokines and inflammation. 2011. T. 10, No. 2. S. 42-49.
3. Grigoriev E.V., Matveeva V.G. 1, Shukevich D., Radivilko A.S., Velikanova E.A., Khanova M.Yu. Induced immunosuppression in critical conditions: diagnostic capabilities in clinical practice. //Bulletin of Siberian Medicine. 2019; 18 (1): 18-29.
4. Efimova LP, Vinokurova T.Yu. Informative value of indicators of peripheral blood. //RUDN Bulletin, Medicine Series, 2008, No. 8, p 373-367.
5. Kashaeva L.N. Immunological disorders and the role of their correction in the prevention of pneumonia in cerebral strokes: author of dissertation for a scientific degree PhD. M., 2005. 21 p.
6. Krylov V.V., Petrikov S.S., Talypov A.E., Puras Yu.V., Solodov A.A., Levchenko O.V., Grigorieva E.V., Kordonsky A.Yu. Modern principles of surgery for severe traumatic brain injury. Journal named after N.V. Sklifosovsky "Emergency medical care". 2013; (4): 39-47.
7. Kulyutsina E.R. Laboratory criteria for predicting the course and outcome of traumatic brain injury: Author's abstract of dissertation for a scientific degree PhD.. - Saratov, 2004. - 23 p.
8. Lebedev K. A. Immune deficiency (detection and treatment) / K. A. Lebedev. I. D. Ponyakin. - Moscow: Medical book. N. Novgorod: Publishing house of NGMA. 2003. - 443 p.
9. Okhtova F.R. Ischemic stroke and indicators of cellular and humoral immunity (clinical and immunological study): author of dissertation for a scientific degree PhD., 2014. 29 p.
10. Sorokin I.D., Afanasyev A.A., Malinina D.A. Neutrophil-lymphocyte ratio in patients with multiple organ dysfunction syndrome. //Bulletin of Anesthesiology and Reanimatology, Volume 16, No. 3, 2019. Pages 91-92.
11. Speransky I.I., Samoilenko G.E., Lobacheva, M.V. Complete blood count - have all its possibilities been exhausted? Integral indices of intoxication as criteria for assessing the severity of the course of endogenous intoxication, its complications and the effectiveness of the treatment. Health of Ukraine. 2009; 6 (19): 51–57.
12. Trofimov A. Immunological aspects of the postoperative period in traumatic brain injury/ A. Trofimov. A. Kukarin. M. Yuriev // IV Congress of neurosurgeons of Russia: abstracts. report - Moscow. 2006 - S. 376.

Entered 09.02.2022