

LETTER TO THE EDITOR

A new interpretation of neutrophil-lymphocyte ratio from psychiatric aspect

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To the Editor;

Neutrophil-lymphocyte ratio was first defined by Zahorec R. in 2001 as an easy method to evaluate the intensity of inflammation, infection and sepsis. His findings were published in the Bratislava Medical Journal (1). Since then, NLR has been widely studied as a subclinical inflammation marker, as well as that for high-grade inflammation in infection and sepsis (2).

In the past decade, there has been a growing interest in NLR for assessing systemic inflammation in psychiatric disorders. High NLR levels were reported in major depression (3–6), bipolar disorder (7–9), psychotic disorders (10–13), and anxiety-related disorders (14). In all above-mentioned studies, NLR was discussed association with the inflammatory aspect. In this paper, we aimed to point out the explanation of high NLRs in psychiatric studies in an alternative manner.

Autonomic nervous system dysfunction has been considered an underlying mechanism for medical comorbidities in patients with psychiatric disorders (15). The impact of stress and psychiatric conditions on autonomic nervous system is presented as sympathetic and/or parasympathetic dysfunctions (16). Increased sympathetic or decreased parasympathetic activity is manifested as disruption in heart rate parameters. Impaired heart rate variables suggesting high sympathetic and/or low vagal activity have been found in several studies in patients with major depression (17–20), bipolar disorder (21–23), psychotic disorders (24–26) and anxiety related disorders (27).

The brain and the immune system are communicating each other to maintain homeostasis. The autonomic nerve system (ANS) is one of the links between the two systems. The sympathetic nervous system (SNS), a major component of ANS, innervates all lymphoid organs and releases hormones to provide the association between the brain and immune system (28). The two major

types of leukocytes, granulocytes and lymphocytes, are affected by autonomic nerve system. Granulocytes including neutrophils are activated in number and function through sympathetic activation whereas parasympathetic stimulation activates lymphocytes (29). As a net effect, the activation of the sympathetic nervous system triggers leukocytosis with a “left shift”(30) which also means an increment in neutrophil-lymphocyte ratio.

Although high NLR rates in psychiatric disorders are considered to reflect an inflammatory status, it may refer an indirect reflection of the ANS’s imbalance in favor of SNS activity. Therefore, NLR can be interpreted not only as a marker of inflammation, but also an overlooked marker of increased sympathetic activation.

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