

Response to the letter regarding the article “Neutrophil/lymphocyte ratio is associated with right ventricular dysfunction in patients with acute inferior ST-elevation myocardial infarction”

Thank you for the opportunity to reply to comments [1] related to our article “Neutrophil/lymphocyte ratio is associated with right ventricular dysfunction in patients with acute inferior ST-elevation myocardial infarction” [2]. We are very honored to gather feedback on our work.

In acute phase, it was shown that the mortality was reduced following percutaneous intervention or fibrinolytic therapy in patients with acute inferior ST elevation myocardial infarction (STEMI) involving right ventricle (RV) [3, 4]. However, deaths and right-sided heart failure due to RV myocardial infarction are very rare in long-term [5, 6]. Thus, we aimed to search short-term (in-hospital) effects of RV myocardial infarction on mortality via measuring neutrophil/lymphocyte ratio (NLR).

Although there are several methods described to define RV dysfunction, such as catheterization, magnetic resonance imaging, echocardiography is the simplest and easiest to apply in acute setting. To define RV involvement, we preferred to use tricuspid annular plane systolic excursion (TAPSE) levels in accordance with the guidelines [7], since it is easily and quickly measured in acute inferior STEMI setting without significant interobserver difference. Additionally we confirmed RV involvement with RV fractional area change which is smaller in patients with RV dysfunction. Thus, considering TAPSE to define RV dysfunction is methodologically acceptable.

It is known that NLR value and number of leukocyte subgroups can differ according to time and the type of the tubes used for blood sample. However, there was no significant time difference between the groups in respect to time of admission and timing of blood sample collection. Additionally, complete blood count parameters were measured by a hematology analyzer immediately after sampling. Thus, time effect on our results is not valid. Also, all blood samples were carried to hematology analyzer in identical standardized tubes.

Exclusion criteria of our study included all clinical conditions which can possibly affect NLR, such as cancer, presence of active infection, chronic pulmonary disease, pulmonary hypertension, malignancy, end-stage liver disease, renal failure and past history of a systemic inflammatory process. Thus, the results can be attributed to acute myocardial infarction itself. It is known that dehydration can lead to a change in NLR but there is no clear-cut measure to show dehydration or overhydration. Still, inferior vena cava diameter can be used to reflect hydration status. In our study, all patients had inferior vena cava diameter of > 12 mm which is an indirect indicator for absence of dehydration [6]. Thus, we can conclude that our results are free of dehydration effect of NLR. Additionally, inferior vena cava plethora in patients with RV dysfunction was more pronounced than in patients without RV dysfunction and this finding also indirectly reflects the increased right atrial pressure due to RV dysfunction.

Even though red cell distribution width (RDW) is an emerging parameter related to the inflammation, the clinical role of RDW in the evaluation of cardiovascular events has not been confirmed in randomized clinical trials. We didn't think that addition of RDW along with NLR would contribute to findings of our study, thus it was not included.

According to our results, one can easily be aware of the fact that NLR values over 3.5 have significant clinical implication. This finding implied that RV involvement along with acute inferior STEMI induces higher level of inflammatory state including higher number of neutrophils and higher level of stress with more steroid production. Increased steroid level causes suppressed lymphocyte production in bone marrow. This pathophysiological mechanism implies that higher level RV involvement contributes to more significant NLR increase.

In respect to other inflammatory markers, such as C-reactive protein, myeloperoxidase and

fibrinogen, we could not measure these parameters due to lack of financial support and clinical indications. This limitation was mentioned in the article. However, this limitation does not reduce the value of the study since we evaluated the role of the most commonly used hematological marker derived from real life to predict RV dysfunction.

In conclusion, neutrophil to lymphocyte ratio is a universally available hematological marker which can be easily calculated. The results of the present study suggested that this diagnostic test might be used in addition to other tests to predict RV dysfunction in patients with acute inferior ST elevation myocardial infarction.

Conflict of interest: None declared

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