

# Predictive value of neutrophil-leucocyte in cardiac surgery

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Response to: Weedle RC, Da Costa M, Veerasingam D, *et al.* The use of neutrophil lymphocyte ratio to predict complications post cardiac surgery. *Ann Transl Med* 2019;7:778.

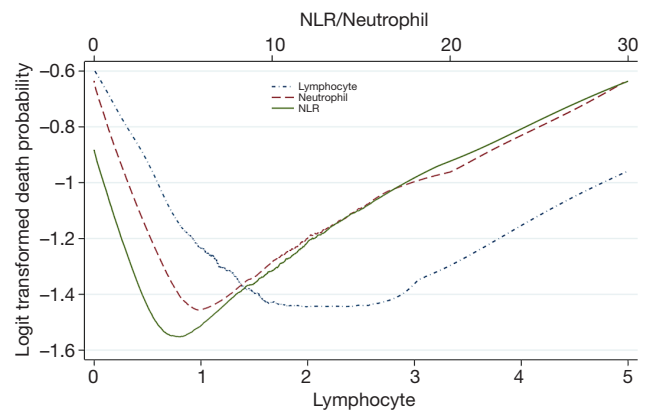
Submitted Oct 29, 2020. Accepted for publication Nov 30, 2020.

doi: 10.21037/atm-20-7191

View this article at: <http://dx.doi.org/10.21037/atm-20-7191>

We read the valuable research by Dr. Weedle *et al.* (1), which examined the association between the neutrophil-lymphocyte ratio (NLR) and postoperative atrial fibrillation in 906 patients undergoing cardiac surgery. They found that high preoperative/postoperative NLR was associated with more postoperative complications.

This is an important finding, and we have several concerns. Recent studies have suggested that NLR acts as an inflammatory index in different populations, including patients with trauma (2), cardiac (3), and renal diseases (4). In most studies, common statistical strategies are to convert the NLR into a dichotomous variable using their respective thresholds or directly add the NLR into a regression model based on the linear assumption to explore its predictive power. However, as a biochemical index with a normal range, either high or low values beyond the normal range can adversely affect it. For instance, in another cohort, both low and high WBC (5) are associated with poor outcomes. Therefore, the potential association between NLR and mortality may be non-linear. Using NLR as a continuous variable in the linear model may lead to a biased estimation (in the current study, it may underestimate a low NLR predictive value. For interpretation, we explore the crude relationship between NLR and outcomes in patients after cardiac surgery, using data from an online international database which contains detailed information of patients admitted to the Beth Israel Deaconess Medical Center (Medical Information Mart for Intensive Care III) (6). A total of 5,537 patients undergoing cardiac surgery were extracted. In-hospital mortality was used as the surrogate outcome as data about postoperative atrial fibrillation



**Figure 1** U-shape correlation between neutrophil, lymphocyte, NLR and in-hospital mortality in patients undergoing cardiac surgery. NLR, neutrophil-lymphocyte ratio.

were not available in this database. Associations between neutrophil, lymphocyte, NLR, and hospital mortality were evaluated using the locally weighted scatterplot smoothing method (*Figure 1*). Overall, a U-shaped relationship was observed between these three biochemical indexes and mortality. Therefore, we suggest that the predictive value of low NLR should also be evaluated in future studies.

This study added important evidence for the prediction of postoperative atrial fibrillation, and their work is appreciated!

## Acknowledgments

*Funding:* None.

## Footnote

*Provenance and Peer Review:* This article was a free submission to the journal. The article did not undergo external peer review.

*Conflicts of Interest:* Both authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/atm-20-7191>). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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**Cite this article as:** Zhang W, Jiang X. Predictive value of neutrophil-leucocyte in cardiac surgery. *Ann Transl Med* 2021;9(1):82. doi: 10.21037/atm-20-7191

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