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Letter to the Editor

Comment on: Hematological parameters and early-onset coronary artery disease: a retrospective case-control study based on 3366 participants

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Dear Editor,

I have read the article, entitled 'Hematological parameters and early-onset coronary artery disease: a retrospective case–control study based on 3366 participants', by H Wang *et al.* which has recently been published in *Therapeutic Advances in Chronic Disease*.[1] Because complete blood count (CBC) instruments are almost universally available, and since CBC-derived indices have been promoted as biomarkers of human disease, including cardiovascular disease, information derived from papers such as this have the potential to improve risk stratification and outcome prediction in coronary artery disease. Although the study by Wang *et al.* covers several CBC parameters, I have confined my remarks to the red blood cell distribution width (RDW), which has emerged as a surrogate marker for systemic inflammation.[2] In particular, I would like to address the preanalytical and analytical phase variables that could impact the test results and could have important implications for study outcomes and individual patient results.

Like other CBC-derived analytes, the RDW is affected by several preanalytical phase variables, including temperature, time between phlebotomy and analysis, transport conditions, and tube type.[3] Furthermore, the methodology of measurement of the RDW, which is reported either as the standard deviation (RDW-SD) or coefficient of variability (RDW-CV) of the red blood cell histogram, varies among instrumentation manufacturers;[4] an internationally recognized consensus for the determination of the RDW does not yet exist. It is therefore important to researchers to recognize the potential causes of preanalytical and analytical phase bias in structuring their studies in order to control for them and to report them, so that clinicians may determine the degree to which the research setting corresponds to their clinical environment.

In reviewing the paper by Wang *et al.*, I note that the potential preanalytical variables have not been reported. However, they reported that the analyzer used in their study was the Sysmex XN (Kobe, Japan). Since the RDW has a limited dynamic range,[5] and the differences between the study and control populations differed by <1 fL (for the RDW-SD) or $<1\%$ (for the RDW-CV), it would be potentially critical to control for these potential preanalytical sources of bias, to avoid putting individual patients into the wrong category. Moreover, for studies such as this one that uses retrospective data, this issue may be particularly problematic, if interval changes in these variables have not been noted.

I therefore would be interested in a response from Wang *et al.* that addresses these issues, in order to provide the perhaps critical level of transparency that would allow clinicians and other readers of *Therapeutic Advances in Chronic Disease* to contextualize these findings to their practice environment.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

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John L. Frater: Conceptualization; Data curation; Investigation; Writing – original draft; Writing – review & editing.

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Availability of data and materials
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References

1. Wang H, Li H and Wang Y *et al*. Hematological parameters and early-onset coronary artery disease: a retrospective case-control study based on 3366 participants. *Ther Adv Chronic Dis* 2023; 14: 20406223221142670.
2. Horta-Baas G and Romero-Figueroa MDS. Clinical utility of red blood cell distribution width in inflammatory and non-inflammatory joint diseases. *Int J Rheum Dis* 2019; 22: 47–54.
3. Frater JL and Hurley MY. Red blood cell distribution width and renal cell carcinoma: a comparative analysis of peer-reviewed studies. *Transl Oncol* 2022; 26: 101558.
4. Lippi G, Pavesi F, Bardi M, *et al*. Lack of harmonization of red blood cell distribution width (RDW) – evaluation of four hematological analyzers. *Clin Biochem* 2014; 47: 1100–1103.
5. Frater JL. Red blood cell distribution width as a biomarker in type 2 diabetes mellitus: technical notes [letter]. *Diabetes Metab Syndr Obes* 2023; 16: 479–481.