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Is the Red Blood Cell Distribution Width-to-Albumin Ratio Sufficient to Predict Cardiovascular Risk?

LETTER TO THE EDITOR

To the Editor,

We read with interest the study by Li et al[1] demonstrating associations between red cell distribution width (RDW), RDW-to-albumin ratio (RAR), and cardiovascular disease (CVD) in 7619 postmenopausal women from NHANES 2003 to 2016.[1] The large sample and rigorous analysis are commendable, but several limitations constrain interpretation.

Key biomarkers were not included in the study. Low-density lipoprotein cholesterol (LDL-C), the primary lipid target in CVD prevention, was omitted despite adjustment for total cholesterol and high-density lipoprotein cholesterol (HDL-C).[2] The authors propose inflammation as the mechanistic link between RDW and CVD, yet no inflammatory markers such as C-reactive protein (CRP) or interleukin-6 were measured. Prior studies have shown RDW correlates strongly with CRP and other inflammatory indices, making these essential to validate the proposed pathway.[3] Without them, the inference that RDW serves as an "inflammatory surrogate" remains speculative. Medication use, particularly statins and anticoagulants, was also unaccounted for. Statins lower inflammation and affect albumin metabolism, while both drug classes are commonly used among older adults with CVD risk factors. Their omission may lead to residual confounding and overstate the independent effect of RDW and RAR.

The incomplete hematologic profile further limits interpretation. Elevated RDW may reflect iron deficiency or anemia of chronic disease, conditions with opposing clinical implications. Without hemoglobin, mean corpuscular volume, and ferritin levels, these mechanisms cannot be distinguished. Iron deficiency, common in postmenopausal women, independently increases cardiovascular risk.[4] The binary "anemia treatment history" variable cannot capture these differences, restricting clinical applicability.

Several subgroup results challenge the biological rationale. RDW was associated with CVD only in non-diabetic women and those with HDL-C ≥50 mg/dL, contrary to expectations if inflammation and oxidative stress are key mediators. The RAR showed broader associations, but whether this reflects greater statistical power or distinct mechanisms remains unclear.

The definition of CVD was narrow, limited to self-reported heart failure, coronary heart disease, angina, myocardial infarction, and stroke. It excluded atrial fibrillation, venous thromboembolism, and peripheral arterial disease, which are mechanistically linked to inflammation and thrombosis. The absence of an association with angina pectoris also raises concern about whether RDW and RAR capture true atherosclerotic burden or reflect more severe, memorable events prone to recall bias in self-reported data.[5]

The cross-sectional design precludes causal inference. Elevated RDW or RAR may be consequences rather than predictors of CVD. Heart failure, showing the strongest association (OR 3.06), can itself reduce albumin through hepatic congestion, suggesting possible reverse causation.

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Li et al[1] highlight accessible biomarkers with potential relevance for risk assessment, but clinical application requires caution. Future research should incorporate CRP, LDL-C, and full iron studies, adjust for medication use, include adjudicated endpoints such as atrial fibrillation and thromboembolic disease, and establish temporal and predictive validity.

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REFERENCES

1. Li C, Yu HQ, Chen Y, Sheng XS. Association of red cell distribution width (RDW) and RDW to albumin ratio with cardiovascular diseases in postmenopausal women: a cross-sectional study based on the NHANES 2003-2016. *Anatol J Cardiol*. 2025;29(11):646-658. [CrossRef]
2. Mach F, Koskinas KC, Roeters van Lennep JE, et al. 2025 focused update of the 2019 esc/eas guidelines for the management of dyslipidaemias. *Eur Heart J*. 2025;46(42):4359-4378. [CrossRef]
3. Lippi G, Targher G, Montagnana M, Salvagno GL, Zoppini G, Guidi GC. Relation between red blood cell distribution width and inflammatory biomarkers in a large cohort of unselected outpatients. *Arch Pathol Lab Med*. 2009;133(4):628-632. [CrossRef]
4. Camaschella C. Iron-deficiency anemia. *N Engl J Med*. 2015;372(19):1832-1843. [CrossRef]
5. Okura Y, Urban LH, Mahoney DW, Jacobsen SJ, Rodeheffer RJ. Agreement between self-report questionnaires and medical record data was substantial for diabetes, hypertension, myocardial infarction and stroke but not for heart failure. *J Clin Epidemiol*. 2004;57(10):1096-1103. [CrossRef]