Carotid-Femoral Pulse Wave Velocity: An Urgent Need for a Harmonization of Denominations

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To the Editor: We read with great interest the article “Association of uric acid with vascular stiffness in the Framingham Heart Study” by Mehta et al.1 highlighting the association of serum uric acid with carotid-radial and carotid-femoral pulse wave velocity (cfPWV) in patients of the third generation of the Framingham Heart Study. We noticed that the authors did not specify the type of cfPWV used in their study, whether in the abstract or in the core of the article. This absence of specific denomination of the PWV used is very frequent in articles focused on cfPWV.

cfPWV is calculated as the travel distance divided by the carotid-femoral transit time (cfPWV = travel distance/transit time) although there are several ways to calculate cfPWV depending on the distance used in the formula.4,5 The choice of distance used is crucial because it can lead to differences of up to 20% in terms of cfPWV.6 Briefly, four types of PWV are usually utilized:

(1) Direct cfPWV: the classical carotid-femoral distance measured over the body surface between the 2 recording sites (the carotid and the femoral arteries);

(2) Real cfPWV: the distance obtained after applying a 0.8 scaling factor to the direct distance for counteracting the overestimation of the anatomical distance: real distance = 0.8 × direct distance;

(3) Subtracted cfPWV: the distance calculated as the subtraction of sternal notch-to-carotid distance from the sternal notch-to-femoral distance; and

(4) Estimated cfPWV: the distance estimated on body height according to the Weber formula: estimated distance = body height/4 + 7.28 cm.

The association with clinical outcome for a given cfPWV varies according to the type of cfPWV considered.5 The type of cfPWV used consequently has practical implications. In addition, different cut-off values have been proposed according to the type of cfPWV—namely 12 m/s for direct cfPWV and 10 m/s for subtracted or real cfPWV.

The purpose of this letter is not to claim that one of the cited methods of cfPWV calculation is better than the others; however, we strongly believe that it is of the utmost importance to provide readers with a clear cfPWV nomenclature in all sections of an article. A clear international nomenclature will prevent misunderstanding in the analysis of articles and results and will also greatly ease meta-analysis in the future.

We thus suggest that investigators use the terms listed above for the denomination of cfPWV (i.e., direct cfPWV, real cfPWV, subtracted cfPWV, and estimated cfPWV), particularly in the abstract. In addition, irrespectively of the method used, we would strongly advocate for a systematic reporting of all travel distances (direct carotid to femoral, sternal notch to carotid and sternal notch to femoral) in addition to body height in order to allow the use of the results by clinicians using only one of the 4 possible cfPWVs in their daily clinical practice. We hope that this specification will add clarity to the PWV literature and promote a wider use of PWV in hypertensive patients.

DISCLOSURE

The authors declared no conflict of interest.

REFERENCES


