

Publication

Retinal pulse wave velocity in young male normotensive and mildly hypertensive subjects

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4376350**Author(s)** Kotliar, Konstantin; Hanssen, Henner; Eberhardt, Karla; Vilser, Walthard; Schmaderer, Christoph; Halle, Martin; Heemann, Uwe; Baumann, Marcus**Author(s) at UniBasel** [Hanssen, Henner](#) ;**Year** 2013**Title** Retinal pulse wave velocity in young male normotensive and mildly hypertensive subjects**Journal** Microcirculation (New York, N.Y. : 1994)**Volume** 20**Number** 5**Pages / Article-Number** 405-15**Mesh terms** Adult; Humans; Hypertension, physiopathology; Male; Pulse Wave Analysis; Retina, physiopathology; Retinal Artery, physiopathology; Vascular Stiffness

Hypertension is characterized by microvascular remodeling resulting in increased wall/lumen ratio and elevated microvascular stiffness. Aiming to transform the measurement of macrovascular stiffness into a microvascular environment we introduce a noninvasive method to assess rPWV. rPWV alterations in early hypertension are investigated in detail. The developed methodology is compared with its possible computational alternatives.; Time dependent alterations of retinal arterial diameter were assessed noninvasively by the DVA in 65 male normoalbuminuric normotensive to mildly hypertensive subjects (age: 28.7 $\pm$ 6.0 years). rPWV was computed using three different methods. "Method 1" used filtration at HR, "Method 2" filtered at higher HR multiples, and "Method 3" used in addition, linear fit for data averaging.; "Method 2" and "Method 3" applying filtration at high HR multiples showed strong associations with systolic BP throughout the cohort ($r = 0.49$, $r = 0.63$, $p < 0.001$). Based on the highest association, "Method 3" was proposed to characterize rPWV. Hypertensive patients showed higher rPWV (1243 $\pm$ 694 RU/sec) than subjects with high-normal BP (786 $\pm$ 486 RU/sec, $p < 0.01$) or normotensive subjects (442 $\pm$ 148 RU/sec, $p < 0.001$).; rPWV demonstrated a strong association with BP and can discriminate between optimal, high-normal, and mildly hypertensive BP values. rPWV may add detailed insights into early microvascular pathophysiology, potentially beyond microalbuminuria.

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