Commentary on Viewpoint: The human cutaneous circulation as a model of generalized microvascular function

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MICROVASCULAR DYSFUNCTION AS A GENERALIZED FEATURE

TO THE EDITOR: Microvascular dysfunction may be one potential factor explaining the clustering of cardiovascular risk factors including hypertension and insulin resistance (5). Whereas assessment of microvascular function of muscle, kidneys, and coronary circulation would be most relevant from a pathophysiological standpoint, it requires invasive and complicated techniques.

Holowatz et al. (3) review the cutaneous microcirculation as a representative vascular bed to examine generalized systemic vascular dysfunction. They support this by stating that cutaneous microvascular dysfunction is associated with various cardiovascular risk factors and disease states. In addition, they demonstrate that aging mechanisms in the cutaneous vasculature parallel those in the systemic vasculature.

We would like to add that the skin is the only site available in humans to directly and noninvasively examine capillaries. We previously demonstrated that hyperinsulinemia induces capillary recruitment in skin, an effect that, in muscle, is proposed to enhance insulin-mediated glucose uptake (5).

A decreased capillary density has been found in many tissues in hypertensive patients and may contribute to increased vascular resistance and elevated blood pressure. According to the Borst-Guyton concept, chronic hypertension can occur only with a shift in the renal pressure-natriuresis relationship, resulting in increased salt sensitivity of blood pressure (2). Subtle renal microvascular disease may reconcile the Borst-Guyton concept with the putative role of microvascular rarefaction in the etiology of hypertension. In accordance, salt sensitivity is associated with microvascular defects not only in kidney (4), rat muscle (1), and conjunctivae (6), but also in human skin.

These data and the data summarized by Holowatz et al. (3) suggest that microvascular dysfunction is a generalized feature not confined to a single organ.

REFERENCES


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