

Distribution Of Microvascular Endothelial Function vs. Blood Pressure In Different Clinical And Non-clinical Settings In The United States And China

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Background:

Despite the fact that microvascular (endothelial) dysfunction is associated with various diseases from cardiovascular to kidney, lung, liver, and other medical conditions, it has not been extensively studied in various clinical and non-clinical settings as blood pressure has. **Digital Thermal Monitoring (DTM) of microvascular endothelial function is a new and automated technique based on monitoring fingertip temperature fall and rebound during a 5-minute arm-cuff reactive hyperemia.** Here we report distributions of microvascular function versus blood pressure across (1) CVD patients, (2) wellness and internal medicine clinics, (3) healthy college students, and (4) community-based healthy volunteers in China.

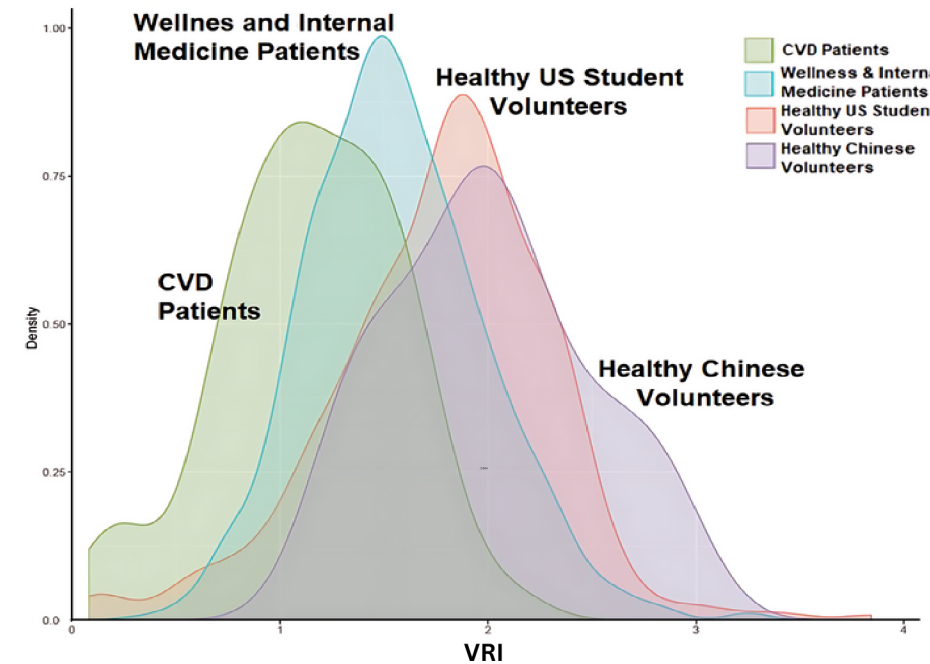
Methods:

A total of 7,907 endothelial function test results were collected from various settings. Blood pressure and heart rate were measured before the tests. The tests were conducted using FDA-approved automated VENDYS devices (Endothelix, American Heart Technologies, Houston, TX). Adjusted maximum temperature rebound was reported as **Vascular Reactivity Index (VRI)** and compared across different settings. **Mean Arterial Pressure (MAP)** is equal to 1/3 systolic pressure plus 2/3 diastolic pressure.

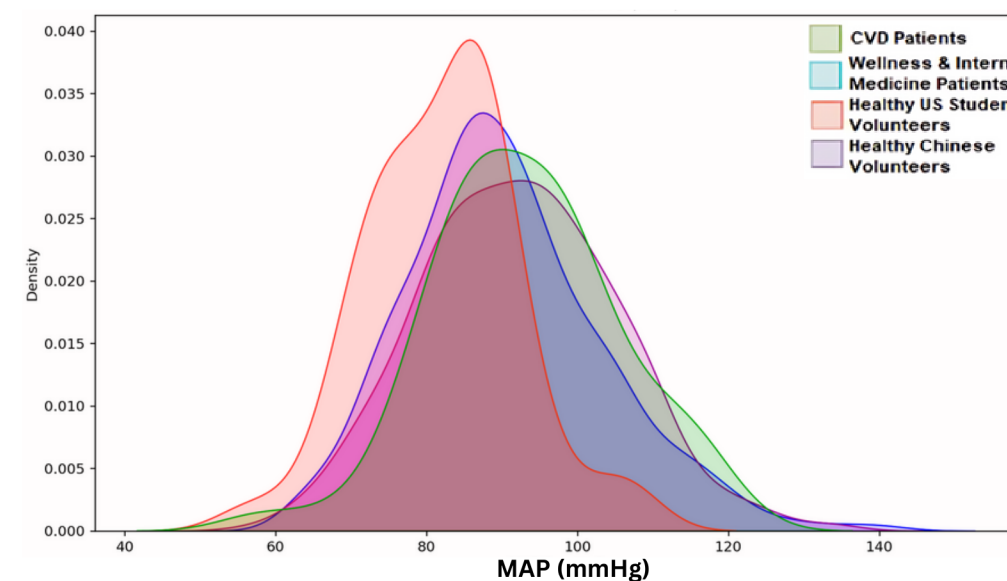
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Density Plots by VRI (Above) and MAP (Below) in Different Risk Groups



Results:

Group	VRI	MAP
CVD Patients	1.25±0.34	93.0±12.2
Wellness and Internal Medicine Clinics	1.53±0.5	90.5±13.1
Healthy US Student Volunteers	1.86±0.5	82.2±9.8
Healthy Chinese Volunteers	1.95±0.44	92.2±13.0
P-Value	P < 0.01	P < 0.01

Conclusions:

To our knowledge, this is the largest database of finger-based endothelial function testing. VRI showed distinct distributions across various clinical and non-clinical settings with CVD patients exhibiting the lowest VRI, and Chinese healthy volunteers the highest VRI. The VRI trend mimics the statistically expected risk trend with CVD patients having the highest and Chinese healthy volunteers having the lowest CVD events risk. **VRI distinguished the various risk categories better than mean arterial blood pressure.** Further studies are warranted to evaluate the incremental predictive value of VRI over blood pressure for CVD risk prediction.