
Flow-mediated dilation and biological variability

Letter to Editor: Flow-mediated dilation (FMD) is an increasingly popular clinical surrogate of endothelial function largely because of its noninvasive nature and deceptively simple methodology. However, as any oenophile will happily tell you, deliberate and thoughtful evaluation are required to appreciate the underlying complex character of a wine. As the spirited debate between Dr. Green and Drs. Tschakovsky and Pyke (1) demonstrates, the same too can be said for FMD. Even when FMD is assessed using the recommended standardized technical approach to minimize measurement (and perhaps mechanistic) variability, the problem of biological variability remains. Despite current widespread use of FMD in clinical trials and research studies, there are few published reports of the reliability and reproducibility of the measurements, and normative data have yet to be established (2–4). Therefore, an important but often overlooked component of rational experimental design for FMD studies is determining variance estimates [between subject, within subject, between days (or weeks, months, or years)] to calculate appropriate sample sizes. Power calculations are rarely reported in FMD studies, but are especially important for reducing the likelihood of false-negative outcomes (type II error). Clearly much work remains to be done to sort out the utility of FMD as a meaningful physiological endpoint, let alone to understand the basic underlying mechanisms.

REFERENCES


Gail D. Thomas
Department of Internal Medicine
University of Texas Southwestern Medical Center
Dallas, Texas
e-mail: gail.thomas@utsouthwestern.edu