

Can arterial stiffness parameters be measured in the sitting position?

[Nürnberg J](#), [Michalski R](#), [Türk TR](#), [Opazo Saez A](#), [Witzke O](#), [Kribben A](#).

Source

Department of Nephrology and Dialysis, HELIOS Kliniken Schwerin, Wismarsche Straße, Schwerin, Germany. jens.nuernberger@uni-due.de

Abstract

Despite the introduction of arterial stiffness measurements in the European recommendation, pulse wave velocity (PWV) and augmentation index (AI) are still not used routinely in clinical practice. It would be of advantage if such measurements were done in the sitting position as is done for blood pressure. The aim of this study was to evaluate whether there is a difference in stiffness parameters in sitting vs. supine position. Arterial stiffness was measured in 24 healthy volunteers and 20 patients with cardiovascular disease using three different devices: SphygmoCor (Atcor Medical, Sydney, Australia), Arteriograph (TensioMed, Budapest, Hungary) and Vascular Explorer (Enverdis, Jena, Germany). Three measurements were performed in supine position followed by three measurements in sitting position. Methods were compared using correlation and Bland-Altman analysis. There was a significant correlation between PWV in supine and sitting position (Arteriograph: $P < 0.0001$, $r = 0.93$; Vascular Explorer; $P < 0.0001$, $r = 0.87$). There were significant correlations between AI sitting and AI supine using Arteriograph ($P < 0.0001$, $r = 0.97$), Vascular Explorer ($P < 0.0001$, $r = 0.98$) and SphygmoCor ($P < 0.0001$, $r = 0.96$). When analyzed by Bland-Altman, PWV and AI measurements in supine vs. sitting showed good agreement. There was no significant difference in PWV obtained with the three different devices (Arteriograph 7.5 ± 1.6 m s⁻¹), Vascular Explorer 7.3 ± 0.9 m s⁻¹, SphygmoCor 7.0 ± 1.8 m s⁻¹). AI was significantly higher using the Arteriograph ($17.6 \pm 15.0\%$) than Vascular Explorer and SphygmoCor ($10.2 \pm 15.1\%$ and $10.3 \pm 18.1\%$, respectively). The close agreement between sitting and supine measurements suggests that both PWV and AI can be reliably measured in the sitting position.