Artery Research
Vol. **26**(**S1**); 2020, *p.* S31
DOI: https://doi.org/10.2991/artres.k.201209.024; ISSN 1872-9312; eISSN 1876-4401
https://www.atlantis-press.com/journals/artres

Conference Abstract

P.10 Distal Arterial Occlusion at Different Grades of Supra-Systolic Pressures Differentially Modulates Flow Velocity and Shear Rates in Radial Artery

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Keywords

Flow alteration
forearm occlusion

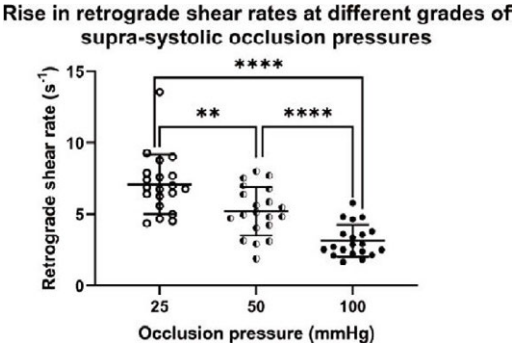
ABSTRACT

Background: Low-flow-Mediated Constriction (LFMC) is considered as a measure of resting endothelial function and is believed to occur in response to reduction in flow during supra-systolic occlusion [1]. However, supra-systolic occlusion may alter flow profile with differential effects on anterograde and retrograde flow, which could potentially affect LFMC response. The current study investigated effect of graded supra-systolic occlusion on radial artery flow profile.

Materials and Methods: Pulsed-wave Doppler in Duplex mode was used to record luminal flow velocity and arterial diameter in 20 healthy volunteers. Anterograde shear rates (AGSR), Retrograde shear rates (RGSR) and Oscillatory shear index (OSI) were calculated using standard formulae. Changes in radial artery flow velocities and shear rates were measured at baseline and in response to graded supra-systolic occlusion at 25, 50 and 100 mmHg applied for 5 minutes.

Results: Significant decrease in anterograde flow velocities and AGSR and increase in retrograde flow velocities and RGSR at all grades of occlusion was observed compared to respective baselines. Percentage reduction in AGSR was significantly higher at 100 mmHg compared to lower pressures (50.34 ± 19.48 vs 21.37 ± 24.27 at 25 mmHg & 35.48 ± 21.27 at 50 mmHg; $p < 0.05$). Occlusion induced rise in RGSR and OSI peaked at 25 mmHg occlusion and showed stepwise decrement at higher grades of occlusion; $p < 0.05$ for all comparisons.

Conclusion: Graded supra-systolic occlusion differentially modulates AGSR, RGSR and OSI in radial artery. Therefore, quantification of resting endothelial function by LFMC may be influenced by grade of distal supra-systolic occlusion pressure applied to induce low flow state.



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