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Cerebrovascular Reactivity and Cerebral Autoregulation are Improved in the Supine Posture Compared to Upright in Healthy Men and Women [↗](#)

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ABSTRACT

Cerebrovascular reactivity and cerebral autoregulation are two major mechanisms that regulate cerebral blood flow. Both mechanisms are typically assessed in either the supine or seated postures, but the effects of body position and sex differences remain unclear. This study examined the effects of body posture (supine vs. seated vs. standing) on cerebrovascular reactivity during hyper and hypocapnia and on cerebral autoregulation during spontaneous and slow-paced breathing in healthy men and women using transcranial Doppler ultrasonography of the middle cerebral artery. Results indicated significantly improved cerebrovascular reactivity in the supine compared with seated and standing postures (supine= 3.45 ± 0.67 , seated= 2.72 ± 0.53 , standing= 2.91 ± 0.62 %/mmHg, $P < 0.0167$). Similarly, cerebral autoregulatory measures showed significant improvement in the supine posture during slow-paced breathing. Transfer function measures of gain were significantly decreased and phase significantly increased in the supine posture compared with seated and standing postures (gain: supine= 1.98 ± 0.56 , seated= 2.37 ± 0.53 , standing= 2.36 ± 0.71 %/mmHg; phase: supine= 59.3 ± 21.7 , seated= 39.8 ± 12.5 , standing= 36.5 ± 9.7 °; all $P < 0.0167$). In contrast, there were no effects of body posture on cerebral autoregulatory measures during spontaneous breathing. Men and women had similar cerebrovascular reactivity and similar cerebral autoregulation during both spontaneous and slow-paced breathing. These data highlight the importance of making comparisons within the same body position to ensure there is not a confounding effect of posture.

EXTERNAL LINK

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ATTACHMENTS

[Favre et al. Postural Effects on CBF_data.xlsx](#)



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