

**Role of Nitric Oxide in  $\beta_2$ -Adrenergic Mediated Vasodilation in Postmenopausal Women**

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**Objectives:** Postmenopausal (PM) women have a blunted  $\beta_2$ -adrenergic receptor-mediated responsiveness when compared to young premenopausal women in part due to a reduction in the relative contribution of nitric oxide (NO) to  $\beta_2$ -adrenergic mediated vasodilation. Hence, we tested the contribution of NO to  $\beta_2$ -adrenergic receptor-mediated vasodilation during terbutaline infusion.

**Hypothesis:** We hypothesized that the contribution of NO to  $\beta_2$ -adrenergic mediated vasodilation would be attenuated in PM women as compared to young women.

**Methods:** Venous occlusion plethysmography was used to measure forearm blood flow (FBF) in 7 healthy young premenopausal women and 9 healthy PM women (mean age =  $27 \pm 1$  and  $60 \pm 1$  years, respectively). FBF was measured at baseline and during terbutaline infusion at 0.1, 0.5, 1.0, 2.0  $\mu\text{g}/100\text{ml}$  tissue/min before (with saline co-infusion) and during NO synthase inhibition with L-NMMA. Forearm vascular conductance was calculated from FBF and mean arterial pressure.

**Results:** In young women, there was a significant L-NMMA effect on forearm vascular conductance during terbutaline infusion with and without L-NMMA ( $1.7 \pm 0.14$ ,  $3.56 \pm 0.41$ ,  $7.13 \pm 1.11$ ,  $7.87 \pm 0.74$ ,  $10.54 \pm 1.81$  versus  $2.08 \pm 0.28$ ,  $5.54 \pm 0.50$ ,  $9.32 \pm 1.10$ ,  $10.77 \pm 1.49$ ,  $13.29 \pm 1.94$  ml/100ml tissue/min/mmHg, respectively). However, there was no effect of L-NMMA in PM women during terbutaline infusion with and without L-NMMA ( $1.34 \pm 0.26$ ,  $2.37 \pm 0.32$ ,  $5.21 \pm 0.99$ ,  $4.71 \pm 0.99$ ,  $6.43 \pm 1.37$  versus  $1.62 \pm 0.31$ ,  $3.11 \pm 0.55$ ,  $5.41 \pm 1.12$ ,  $6.26 \pm 1.38$ ,  $7.26 \pm 1.44$  ml/100ml tissue/min/mmHg, respectively).

**Conclusions:** These data suggest that NO contributes to  $\beta_2$ -adrenergic mediated vasodilation in young premenopausal women. In contrast, no contribution of NO to  $\beta_2$  mediated vasodilation was observed in PM women. These data suggest a lower  $\beta_2$ -adrenergic responsiveness in PM women may be due to a reduced contribution of NO.