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Autor(en) des Beitrags: 
Fischer, T; Schobel, HP; Frank, H; Andreae, M; Schneider, KT; Heusser, K

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Abstract: 
BACKGROUND: Preeclampsia has been shown to constitute a state of sympathetic overactivity. However, it remains unclear if the sympathetic activity precedes preeclampsia or represents only a secondary phenomenon. To further investigate this issue, we performed a prospective study in pregnant women considered to be at increased risk for preeclampsia owing to preeclampsia during a preceding pregnancy.

MATERIALS AND METHODS: Twenty-two women with a history of preeclampsia were longitudinally studied on three occasions: twice during pregnancy (M1: 22 +/- 4, M2: 33 +/- 5 weeks) and once postpartum (M3: 26 +/- 6 weeks postpartum). We measured muscle sympathetic nerve activity (MSNA), forearm blood flow, and blood pressure at rest and during reactive hyperaemia after forearm occlusion. RESULTS: At M1 and M2, none of the subjects was hypertensive, however, muscle sympathetic nerve activity levels were significantly augmented, compared with their postpartum values (M1: 21 +/- 9, M2: 29 +/- 14, M3: 9 +/- 5 bursts min(-1); P < 0.05). Forearm vascular resistance did not significantly change from M1 through M3 (M1: 16 +/- 9, M2: 15 +/- 7, M3: 16 +/- 7 U; P = NS). Gestational muscle sympathetic nerve activity values did not differ significantly among the subjects with subsequent preeclampsia compared with those who remained normotensive [with preeclampsia (n =
6): M1: 21 +/- 5, M2: 27 +/- 6, M3: 7 +/- 4 bursts min^{-1}; without preeclampsia (n = 16): M1: 21 +/- 11,
M2: 30 +/- 16, M3: 9 +/- 6 bursts min^{-1}; P = NS] CONCLUSION: Invariably, all women at risk for
preeclampsia showed a pregnancy-induced increase in MSNA (pregnancy-induced sympathetic
overactivity, PISO), which normalized after delivery. Most importantly, PISO is not necessarily
associated with peripheral vasoconstriction and hypertension. Furthermore, only a subset of patients
developed preeclampsia later on. Therefore, we hypothesize that PISO constitutes a precursor of
preeclampsia which is physiologically compensated for by vasodilating mechanisms, leading to
preeclampsia only when they fail.

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