Hypersensitivity of spontaneously hypertensive rats to heat and ether before the onset of high blood pressure.

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Hypertension-prone, male, spontaneously hypertensive rats (SHR; n = 60) and normotensive, male, Sprague-Dawley rats (S-D; n = 60) were exposed to the relatively innocuous stimulus of heat and ether when they were 40 days of age, just before the usual onset of high blood pressure in SHR. The animals were decapitated 0, 2, 5, 15, and 60 min postexposure to heat and ether. Blood levels of corticosterone, aldosterone, PRL, GH were measured concomitant with pituitary content of GH and PRL and adrenal content of ascorbic acid and cholesterol. The foregoing constituents were used as an index of pituitary-adrenal responsiveness. Changes in circulating corticosterone, PRL, GH, and especially aldosterone indicated that before the onset of their high blood pressure, SHR are much more responsive to noxious stimuli than normotensive S-D. The pattern of change in the pituitary content of GH and PRL, adrenal ascorbate, and cholesterol were also indicative of SHR hypersensitivity. These findings suggest that adrenal steroidogenesis and the stress response pattern in SHR vs. normotensive rats may be unique.

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