36) Elemental Behaviors in SHR.

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INTRODUCTION The purpose of the present studies is to investigate elemental behaviors in hypertensive and normotensive rats; We examined responses to stimulus of hot water in SHRSR, SHRSP and WKY in the first experiment, and general activities in an open-field among various rat strains including SHRSR, SHRSP and WKY in the second experiment.

MATERIALS AND METHODS Hot water method: Adult, male SHRSR, SHRSP and WKY which were maintained in Shimane Institute of Health Science and Shimane Medical University were used. Five age-groups (1.5, 2, 5, 7 and 17 months) in SHRSR and WKY and 4 age-groups (except for 17 months) in SHRSP were studied. Each age-group consisted of 5 to 8 rats. For the objective determination of responses to the hot water stimulus, the latent time before raising the tail above hot water following the soaking of a half of the length of the tail into hot water ($55\pm 1^{\circ}\text{C}$) was measured.

Open-field testing: Male SHRSR and WKY aged 1.5, 5 and 17 months and SHRSP at the age of 1.5 and 5 months were used. Open-field testing was conducted in the circular arena of 62cm in diameter. The floor was separated with mark into 19 radial segments of equal size. The arena was illuminated with a 60W lamp suspended at 100cm above the floor. Ambulation activity was defined by the passage of all four legs through one segment to another, and rearing was defined as standing on hind legs. Each rat was observed for counting grooming, ambulation and rearing scores in the open-field for 3 minutes. WKY/N and OM/N both from National Institutes of Health, U.S.A., and Wister/crj from Charles River Japan, aged 5 months were employed in the hot water method and open-field testing.

RESULTS Hot water method: The latent times before raising the tail above hot water were significantly longer in 1.5, 2 and 5-month-old SHRSP and 2 and 3-month-old SHRSR, but significantly shorter in 5 and 17-month-old SHRSR, and WKY/N and OM/N aged 5 months than those in the age-matched WKY.

Open-field testing: Ambulation scores for SHRSR and SHRSP in various age-groups were greater than those of WKY, especially significantly greater in 1.5-month-old SHRSP, and 1.5 and 5-month-old SHRSR. Rearing scores for SHRSR and SHRSP in all age groups, WKY/N, Wister/crj and OM/N were significantly greater than those for the age-matched WKY. There were no difference in grooming among these strains.

DISCUSSION The responses to the hot water stimulus indicate pain sensitivity. SHRSR and SHRSP showed clearly diminished pain sensitivity in the young age. Pain sensitivity may partly depend on the aging in the rat. In the open-field testing, higher ambulation activity in SHRSR and SHRSP, lower rearing activity in WKY were observed. SHRSR and SHRSP at the prehypertensive stages displayed higher ambulation and rearing activities than normotensive strains. So these differences may not be caused secondarily to hypertension.