Cardiovascular and the Other Various Events Complicated in the Long-term Breeding of Rats

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This study aims to investigate the various events, especially cardiovascular ones in the long-term breedings of normotensive rats and spontaneously hypertensive rats (SHR). Stroke-prone SHR (SHRSP) were 285 males and 294 females, stroke-resistant SHR (SHRSR) were 218 males and 261 females, and Wistar Kyoto rats (WKY) were 213 males and 300 females. Systolic blood pressure was measured by tail cuff-method (Narco PE-300). Under anesthesia with intraperitoneal urethan (1 ml of 10% solution per 100 g body weight) electrocardiogram (ECG) was recorded on supine position using the needle electrodes. Microscopic specimens of some tissues were prepared with HE staining. Systolic blood pressure was 132 mmHg on an average in male WKY, 120 mmHg in female WKY, 171 mmHg in male SHRSR, 157 mmHg in female SHRSR, 204 mmHg in male SHRSP and 182 mmHg in female SHRSP, being higher significantly in male rats than in female rats, highest in SHRSP and lowest in WKY. The estimated survivals were about 30 months old in WKY, 29 months old in SHRSR, 20 months old in male SHRSP and 24 months old in female SHRSP in Institute for Laboratory Animals. In SHRSP, cerebral softening and bleeding were found since 15.5 months old, while these were very rare in SHRSR and not observed in WKY. As a hypertensive vascular lesion, periarteritis nodosa (PN) of mesenteric artery was found since 9 months old, especially often since 15 months old in SHRSR, while it was very rare in SHRSR and not found in WKY. On ECG in rats aged less than 10 months (young rats), PQ intervals were 0.043 sec on an average in 26 male and 20 female WKY, 0.05 sec in 10 male SHRSR, 0.047 sec in female SHRSR, 0.048 sec in male SHRSP and 0.053 sec in 13 female SHRSP, indicating a significant prolongation in female SHRSP than in female WKY and SHRSR. In rats aged more than 20 months (old rats), PQ ones were 0.058 sec in 12 male WKY, 0.049 sec in 37 female WKY, 0.061 sec in 25 male SHRSR, 0.058 sec in 63 female SHRSR and 0.063 sec in 31 female SHRSP, showing a significant prolongation in female SHRSP compared to female WKY and SHRSR. In comparison between young and old rats, rats showed a significantly longer interval of PQ than in young rats. SV₁+RV₅ on ECG became higher significantly with aging in both SHRSR and SHRSP. In rats aged 15 to 20 months, ST depressions more than 1 mm were found only in 55.6% of male SHRSP and 34.8% of female SHRSP. In rats aged more than 20 months, ST ones were found in 16.7% of male WKY, 5.4% of female WKY, 24% of male SHRSR, 15.9% of female SHRSR and 45.2% of female SHRSP. Cataracta of lens was observed in many rats since 6 months old in SHRSP, since 12 months old in SHRSR and since 24 months old in WKY. Bladder stones were found only in 5 male and 2 female WKY aged 13 to 27 months, which contained 6 to 61 stones per one bladder. Subcutaneous benign tumors weighed 85 g on an average were fibroadenoma microscopically, of which the frequency in rats aged more than 12.5 months was 6.7% of 135 male WKY, 6.8% of 219 female WKY, 4% of 174 male SHRSR, 21.6% of 190 female SHRSR, 1.4% of 207 male SHRSP and 4.4% of 10 female SHRSP, showing the highest occurrence in female SHRSR. Various events in the breeding period and ECG findings were shown in this study.