

## Spontaneous baroreflex sensitivity in adult rats hypoxic neonatally

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**Introduction:** We have previously shown that neonatal hypoxia is associated with an increase in systolic arterial pressure in 2 month old rats. To determine whether alterations in autonomic control are implicated in this increase we have examined baroreflex sensitivity.

**Methods:** Eighteen adult, 60 day old, Sprague-Dawley male rats were studied. Half of the animals were neonatally hypoxic (NH) ( $FiO_2=0.12$ , days 1-10 of life) while the others were not (Control). The rats were instrumented with intravascular telemetric blood pressure transmitter probes (Data Sciences International) to monitor abdominal aortic pressure. One week following instrumentation systemic arterial pressure was continuously monitored by telemetry for 24 hours. Systolic blood pressure (SBP) and pulse interval (PI) were determined for all beats over thirty minute periods at noon and midnight. Sequences of three or more consecutive heart beats with directionally similar changes in SBP and PI were noted. Over 5,000 sequences during nighttime and daytime in 18 rats were individually plotted as PI versus SBP. The average of all slopes with a correlation coefficient greater than 0.85 was taken as an index of baroreflex sensitivity.

**Results :** As we previously reported systemic arterial pressure was greater in 2 month old rats that had been hypoxic neonatally (Night-time: NH; systolic  $130\pm 3$  mmHg, diastolic  $85\pm 2$  mmHg. Control; systolic  $121\pm 3$  mmHg, diastolic  $81\pm 2$  mmHg ; Daytime NH; systolic  $123\pm 2$  mmHg, diastolic  $79\pm 1$  mmHg, ; Control: systolic  $116\pm 3$  mmHg, diastolic  $76\pm 2$  mmHg,  $P<0.05$ ). Baroreflex sensitivity was significantly less during nighttime but not daytime in the rats hypoxic neonatally (night-time: NH =  $0.84\pm 0.09$  msec/mmHg, Control =  $1.24\pm 0.17$  ( $P<0.05$ ); daytime: NH =  $1.18\pm 0.07$ , Control =  $1.43\pm 0.14$ ).

**Conclusions:** Our results indicate that baroreflex sensitivity is decreased in adult rats hypoxic neonatally during their active night-time period. Although baroreflex sensitivity was also less during daytime this did not achieve significance. This suggests that neonatal hypoxia has longterm effects on autonomic control of systemic arterial pressure during activity. Impaired baroreflex sensitivity has been suggested to be involved in the development of systemic hypertension. This work may have important implications for the care of a growing population of adult "survivors" of congenital cyanotic heart disease.