45) Methionine Enkephalinergic Neurons in Cerebral Nuclei of SHR at Various Developmental Stage. Keiji Nakamura, and Tetsuo Hayashi. Department of Pharmacology, Nippon Roche Research Center, Kamakura 247.

In some cerebral nuclei of SHR, alteration of met-enkephalin like immunoreactivity (MELI) has been confirmed independently at 4 and 20 weeks of age (JPN J HYPERTENSION 4:22, 1981). The present study was designed to measure MELI and met-enkephalin receptor binding (MERB) in cerebral nuclei of SHR and WKY at pre- and post-natal stages.

We used 6 paired groups of male SHR and WKY: 14 and 18 days after conception, the day of birth, and 1, 4, and 20 weeks after birth (n=8 animals/group). In 86 cerebral nuclei, MELI and MERB levels were measured respectively by the immunohistochemistry antibody and autoradiogram prepared by incubating frozen brain slices (5 μ m) with ^3H -ME (4 nM). Unspecific bindings were 3%. Assay limits of MELI and MERB were 20 and 10 pmole/g.

In both prenatal stages, MELI was detected in the n. ambiguus, n. reticularis lateralis, n. interpeduncularis, n. supraopticus, n. suprachiasmaticus, n. periventricularis, n. arcuatus, and n. amygdaloideus lateralis, centralis and medialis, the 10 nuclei among 86 nuclei examined so far. At the day of birth, the levels in the 10 nuclei increased by 3-fold and those not detected in 76 nuclei abruptly appeared. MELI levels were decreased by 30-40% at 4 weeks after birth and the levels maintained at 20 weeks after birth.

In the prenatal period, MELI levels in these 10 nuclei of SHR and WKY did not differ. However, in the day of birth and 1 week after birth, MELI levels only in the tractus spinalis nervi trigemini (TSNT) were lower in SHR than in WKY (Table). Low levels persisted in those at 4 weeks of age but not at 20 weeks of age. ME containing axon and fiber were found in the TSNT.

Group	MELI (pmole/g) in the tractus spinalis nervi trigemini (n=8)		
	WKY	SHR	%
14 days after conception	< 20	< 20	
18 days after conception	< 20	< 20	
The day of birth	344 $\pm$ 27.6	231 $\pm$ 16.5 ^b	-33
1 week after birth	395 $\pm$ 27.4	263 $\pm$ 24.2 ^b	-33
4 weeks after birth	271 $\pm$ 20.7	201 $\pm$ 16.0 ^a	-26
20 weeks after birth	214 $\pm$ 20.3	215 $\pm$ 20.8	

a P < 0.05   b P < 0.01

In young SHR at 4 weeks of age, both MELI and MERB in the n. arcuatus, n. corporis mamillaris lateralis and n. reticularis lateralis, MELI in the TSNT, and MERB in the NTSNT and median eminence were lower than those in young WKY. However, both MELI and MERB in the n. amygdaloideus medialis, stria terminalis nuclei and n. dorsalis nervi vagi, and MERB in the n. amygdaloideus centralis were higher in SHR than in WKY. These alteration disappeared in adult SHR at 20 weeks of age.

In adult SHR at 20 weeks of age, MELI and MERB in the n. reticularis medialis, MELI in the n. accumbens septi and MERB in the n. caudatus were higher than those in adult WKY. Acute hypertension made by angiotensin II did not alter both levels in these nuclei.

In conclusion, delayed maturation of met-enkephalinergic neurons in the tractus spinalis nervi trigemini in the early postnatal period may be pre-requisite for induction of sympathetic activation as observed only in young SHR as the trigger mechanism for the development of hypertension.