

Expression analysis of mast cell-related genes in fetal and neonatal periods of spontaneously hypertensive rats (SHR)

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Mast cells are not only responsible for immune functions, but are also involved in the development of various diseases. Previously, we analyzed and reported about the appearance pattern of mast cells in the early stages of development in normal Wistar rat strain. It has been also reported that chymase accumulated in granules of mast cells is involved in the development of hypertension. In this study, we analyzed the relationship between mast cell expression patterns in the early stages of development and the onset of hypertension using model animals.

We used three strains of rats, SHR/NCrj, WKY/Ncrj rats and Wistar/Slc rats. They were planned to become pregnant, and fetuses at 9.5, 11.5, 13.5, 15.5, and 18.5 days of gestation and neonates at 1, 3, 7, and 14 days after birth were obtained. mRNA was purified from whole embryos or several tissues at each stage. RT-PCR was performed using primers for six molecules, i.e., c-kit, FcεRI, rMCP-I, rMC-CPA, VEGF, and TNFα.

As a result, there was almost no difference in the expression timing and localization of rMCP-I among strains. However, there were significant differences in the expression patterns of c-kit and VEGF during embryonal stages. The difference between Wistar and WKY was greater than Wistar and SHR. It was considered that the development of hypertension is associated with the maintenance or differentiation of blood stem cells and the development of vascular system rather than the expression pattern of mast cells. It was also suggested that WKY rats may have already been committed to the development of hypertension.