The Japanese Teratology Society

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C-34
TAKANO, T., Y. KAMIYA, M. OHNO, T. YAMANO and M. SHIMADA, Department of Pediatrics, Shiga University of Medical Science, Ohtsu, Shiga. Experimental myxovirus-induced hydrocephalus: Determination of critical period of development of hydrocephalus after intracerebral mumps virus inoculation.

This study was undertaken to determine the critical period for hydrocephalus.

Syrian hamsters, 2, 10, 30 and 50 days of age, were given a single intracerebral inoculation containing 2 TCID50 of mumps virus.

Animals were sacrificed on various days after inoculation, and the development of hydrocephalus was histologically examined. Immunohistochemical studies were then carried out to examine reactive changes of the glial cells using anti-glial fibrillary acid protein (GFAP) antibody. Localization of mumps virus antigen was also identified using hyperimmune serum to mumps virus.

Hydrocephalus developed not only in suckling hamsters inoculated 2 and 10 days after birth, but also in young adult hamsters inoculated 30 and 50 days of age. In all hydrocephalic animals, focal denuding of the ependymal cell was observed. However, aqueductal stenosis was observed only in suckling hamsters accompanied by marked periaqueductal proliferation of GFAP positive cells, and subsequently progressive and fatal hydrocephalus developed. The distribution of mumps virus antigen was mostly localized in the ependymal cell and choroid plexus. In hamsters inoculated 2 days after birth, however, mumps virus antigen was observed on neurons of the cerebral cortex, hippocampus, midbrain and cerebellum.

These results suggest that in animals inoculated with mumps virus earlier in life, hydrocephalus becomes severer with aqueductal stenosis, though there was no apparent critical period of development of hydrocephalus.

C-35
EDWARDS, M.J., J. CAWDELL-SMITH, M.S.R. SMITH and J. UPFOLD, Faculty of Veterinary Science, University of Sydney, and Faculty of Medicine, University of N.S.W., Australia. Defects of the neural tube and head induced in early guinea-pig embryos by hyperthermia.

Hyperthermia between days 16 and 32 of pregnancy in guinea-pigs causes a number of serious developmental defects, but few defective newborns are seen after heat at earlier stages. The neural tube closes at day 13 of pregnancy. Heat at this stage commonly causes abortion at 30–35 days and although some fetuses survive to birth no newborn have had neural tube defects, suggesting that embryos with these defects were eliminated. To test this hypothesis, female guinea-pigs were exposed at 9 am and 3 pm on days 11, 12, 13 or 14 of pregnancy for 1 hr to 43×0.5 °C, which elevated core temperatures by 3.5–4°C. They were killed on day 25 and the embryos examined. The results are summarized in Table 1.

Day No.Preg- No.with Total Abnormal Embryos
nant abnormal embryos Resorb- Mal- embryo(%) ing(%) formed(%) 11 11 0 28 4(14) 0 12 10 2(20) 32 1(3) 4(13) 13 32 13(41) 106 18(17) 27(26) 14 21 6(29) 62 8(13) 14(23) 15 35 0 118 2(11) 7 0

The defects are summarized in Table 2.

Kyphosis- Microph- Neural Micro- Other Total scoliosis thalamic tube cephaly

Day