Expression of the growth-related factors in the liver of fetal rats

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Purpose: The birth rate of low delivery weight infants and that of preterm delivery in Japan are high among developed countries. Such low weight infants often develop physiological jaundice, that frequently matters. The fetal liver function is usually immature, and low weight, preterm delivered infants tend to be worse. We intended to evaluate and study about the liver maturation and its function in preterm infants.

Methods: The fetal rats were delivered by cesarean section on gestational days 19 (19F), 21 (21F) in gestational rats. 1-day-old-neonates (1N) were sacrificed under isoflurane anesthesia. The various growth-related factors mRNA levels in the liver tissues were analyzed using real-time RT-PCR. The growth-related factors are as follows, cell proliferation (ki-67), cell cycle (Cyclin B, and CDK1), stem cell marker (Thy-1, and DLK1), maturity factors (Albumin, HNF4 α , HGF), and metabolic factors (G6Pase, TAT, UGT1A).

Results and Discussion: The mRNA levels of Ki-67, Cyclin B, CDK1, Thy1, and DLK1 were gradually decreased with from fetal to neonatal period. On the other hand, the mRNA levels of HGF, TAT, and UGT1A in 19F rats were lower than 1N rats. Albumin, HNF4 α , and G6Pase mRNA levels were tended to increase with growth but there were no significant difference. The proliferative cells and stem cells were decreased and the various metabolic enzymes were subsequently increased in the liver from fetal to neonatal period. These results may suggest that the low levels of the growth-related factors result liver function failure in immature infants.