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RELATIONSHIP BETWEEN HYPOTAURINE CONCENTRATION AND EXPRESSION LEVELS OF EZRIN AND SLC6A13 TRANSPORTER IN MICE PLACENTA DURING PREGNANCY

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ABSTRACT

We have shown that a deficiency of ezrin in mice decreases the fetal weight as well as the placental and fetal concentrations of hypotaurine, an antioxidant especially abundant in the fetus. Moreover, ezrin positively regulates the hypotaurine uptake via Slc6a13/GABA transporter (GAT) 3, leading the hypothesis that the presence of Slc6a13/ezrin complex in the placenta plays an important role in the fetal growth by determining fetoplacental concentration of hypotaurine. The purpose of this study is to examine the relationship between the hypotaurine concentration and expression levels of ezrin and Slc6a family transporters in mice placenta at different stages of pregnancy. Hypotaurine concentration in the placenta was determined using LC-MS/MS. The placental expressions of ezrin, Slc6a1/GAT1, Slc6a12/GAT2, Slc6a11/GAT4, Slc6a6/TauT, and Slc6a13/GAT3 from gestational days 10 to 18 (E10-E18) were quantified by real-time PCR and expressed as copy numbers per ng total RNA. Hypotaurine concentration in the placenta was 60 nmol/g-placenta at E10 and was significantly increased to more than 180 nmol/g-placenta after E12. Ezrin was consistently expressed in the placenta as high as more than $1x10^4$ copies. On the other hand, the transcript level of Slc6a13 was transiently increased to approximately $3x10^2$copies at E12 and E14 but was less than 50 copies at other gestational days. The transcript levels of Slc6a1 and Slc6a6 were unchanged from E10 to E18 but that of Slc6a12 was decreased by 50% after E12. In conclusion, significant increases in Slc6a13 expression and hypotaurine concentration were both occurred at E12 in the mouse placenta.