

**CEREBRAL GLUCOSE METABOLISM MEASURED BY POSITRON EMISSION
TOMOGRAPHY IN PRETERM, TERM NEWBORN INFANTS AND NEONATAL HYPOXIC-
ISCHEMIC ENCEPHALOPATHY**

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Objective: To study the clinical value of cerebral glucose metabolism measure by ¹⁸F-fluorodeoxyglucose ¹⁸F-FDG PET in preterm, term newborn infants and neonatal hypoxic-ischemic encephalopathy (HIE).

Methods: To measure the cerebral glucose metabolism by ¹⁸F-FDG PET imaging in newborn infants. Sixty infants were included in the study. The data was collected by PET instrument after administration of 0.1mCi/kg ¹⁸F-FDG, and standardized uptake values (SUV) were calculated to estimate the cerebral glucose metabolism.

Results: The cerebral glucose metabolism was found to have a trend to be increased, and the structure of brain ¹⁸F-FDG PET imaging to be clear with the increase of gestational age, especially when the gestational age was older than 37wk. The brain ¹⁸F-FDG PET imaging in different gestational age showed that the uptake of ¹⁸F-FDG was relatively higher in thalamus, cerebellum, sensorimotor cortex and basal ganglia, where as relatively lower in cerebral cortex. The uptakes of ¹⁸F-FDG in ≥ 37 wk group were found to be significantly higher than those in ≤ 32 wk group ($p < 0.01$). The cerebral glucose metabolism was significantly changed in neonatal HIE. The cerebral uptake of ¹⁸F-FDG was either unbalanced bilaterally or relatively low in all sites especially in subcortical alba, thalamus, basal ganglia in HIE patients. Moreover, The uptakes of ¹⁸F-FDG in severe HIE patients were found to be significantly lower than those in mild and medium HIE patients ($p < 0.05$).

Conclusions: Cerebral glucose metabolism measured by ¹⁸F-FDG PET might be a useful tool for estimating the brain development and injury in newborn infants, and its clinical values need further investigating.