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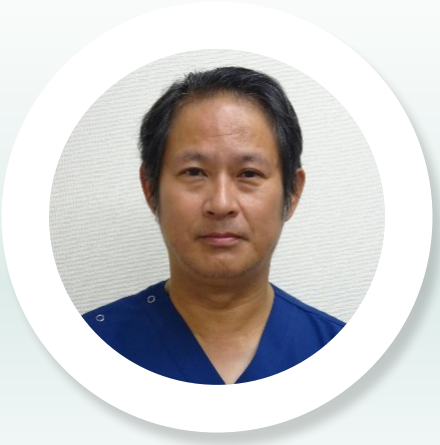

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Prevention and treatment of induced hypothalamus-pituitary-adrenal dysfunction in preterm infants

An impaired HPA axis is an important risk factor for inflammatory disease, somatic fatigue, pain disorders, and psychiatric conditions such as depression and post-traumatic stress disorder. The activity of the HPA axis is regulated by the hypothalamic glucocorticoid receptor (GR) encoded by the nuclear receptor subfamily 3 group C member 1 *(NR3C1)* gene, which mediates a negative feedback loop. We showed that a postnatal environment featuring a need for acute care and prolonged physical separation in the neonatal intensive care unit (NICU) affects epigenetic programming of GR expression via methylation of the *NR3C1* promoter in premature infants. Of the various NICU-associated procedures, intrauterine growth restriction and postnatal glucocorticoid administration to treat circulatory collapse were the independent variables most strongly associated for a change in methylation rate, and also affected the methylation rate at two months of age which results in hyperactivity of HPA axis. Given the well-documented adverse consequences of preterm birth, such birth has been considered to be a vulnerability factor. However, recent research has suggested that preterm birth may, instead, be a plasticity factor; thus, a factor increasing sensitivity to both negative and positive environmental influences. This is a component of the differential susceptibility (DS) model. If this is true, this would have important implications when designing interventions seeking to improve the developmental functioning of preterm infants. In this session, we will discuss about prevention and treatment of GR methylation by "on demand" steroid administration, kangaroo care, sucrose administration, methionine infusion, or traditional Chinese medicine.

Biography

Masato Kantake has completed his PhD from Chiba University. He is the Director of Neonatal Medical Center of Juntendo University Shizuoka Hospital. He is Senior Associate Professor of Pediatrics, School of Medicine, Juntendo University. He has published two papers related to epigenetics in neonatal period.

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