

# Effects of Maternal Hyperhomocysteinemia on the Early Physical Development and Neurobehavioral Maturation of Rat Offspring

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## Abstract

© 2016, Springer Science+Business Media New York. During pregnancy, several complications have been associated with hyperhomocysteinemia (HHcy) and elevated homocysteine (Hcy) levels have been shown to play a role in the etiology of preeclampsia, placental abruption, intrauterine growth retardation, and neural tube defects and associated with the neurological consequences. In the present work, we investigated the effects of chronic maternal HHcy on the development and neurobehavioral maturation of the offspring. We analyzed classical parameters of development such as body weight, eyelid opening, ear unfolding, incisor eruption, and the appearance of hair, and subjected the pups to various tests that reflected the neurobehavioral maturation extending from 4th to 20th postnatal days (righting reflex, negative geotaxis, cliff avoidance, head shake, acoustic startle reflex, free-fall righting, cliff avoidance caused by visual stimulus, olfactory discrimination). We have shown that newborn animals were characterized by lower body weight and higher mortality. Besides, the delay in neurobehavioral maturation of the pups from the Hcy group was observed. The obtained results indicate that early developmental impairments of brain maturation induced by prenatal HHcy may underlie long-term deficits in the learning and memory behaviors.

<http://dx.doi.org/10.1007/s12668-016-0326-6>

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## Keywords

Maternal hyperhomocysteinemia, Neonatal development, Neurobehavioral maturation, Rat

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