

eP1058

Morphine exposure and maternal deprivation during the early postnatal period alter neuromotor development and nerve growth factor levels

Natalia P. Silveira, Carla de Oliveira, Vanessa L. Scarabelot, Rafael Vercelino, Lauren N. S. Adachi, Gabriela G. Regner, Isabel Cristina de Macedo, Andressa de Souza, Wolnei Caumo, Iraci Lucena da Silva Torres - UFRGS

Introduction: Adverse early life experiences such as exposure to morphine and maternal deprivation can trigger a developmental delay, negatively affecting brain development and increasing the risk of the occurrence of behavioral alterations. Objective: The objective of this study was to verify whether repeated morphine administration and maternal deprivation in early life alter neurobehavioral development and central nerve growth factor (NGF) levels. Methods: A total of 58 male Wistar rat pups were used in our study. From postnatal day 1 (P1), litters were daily deprived of their mother for 3 hours; this was continued for the first 10 days of life. Animals were divided into 5 groups: total control (C), did not receive any intervention; saline (S), received saline solution; morphine (M), received morphine; deprived-saline group (DS), were subjected to maternal deprivation and received saline solution; and deprived-morphine (DM), were subjected to maternal deprivation and received morphine. From P8, newborns received subcutaneous (s.c.) injections of morphine or saline (5 µg) once daily for 7 days. Righting reflex and negative geotaxis were chosen as postural parameters to evaluate neuromotor reflexes. The NGF levels in brainstem and cerebral cortex were determined by sandwich-ELISA assay. Statistical analysis was performed by Generalized estimating equation (GEE) followed by Bonferroni to development of neuromotor reflexes tests and one-way ANOVA followed by the Student Newman-Keuls (SNK) test to biochemical data. Project was approved by Ethics Committee of CEUA/HCPA: 15-0614. Results: In the righting reflex test, a delay in the development of animals was evidenced in the M group. Performance of negative geotaxis was slower in the M and DM groups. The DM group presented an increase in NGF levels in the brainstem. An increase in cerebral cortex NGF levels in the M, DS, and DM groups was observed as well. Conclusion: Our results suggest that changes in environmental conditions and the disruption of mother–infant interactions during the neonatal period can produce changes in the neurobiology, physiology, and emotional behavior of rats. This finding has important implications for the maternal-neonate interaction needed for normal brain development in newborns. Keywords: morphine, maternal deprivation, neonate rats