Assessment of the effects of maternal deprivation in offspring treated with ultra-high diluted Zincum metallicum in rats

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Abstract

Introduction: Clinical studies have shown that adverse events in childhood can lead to the development of psychiatric disorders, such as anxiety, in adolescence and adulthood in humans. Manipulations with laboratory animals, such as maternal deprivation (MD), are a source of stress for the offspring and can be a useful tool for the understanding how these events in the early period of development can lead to behavioral changes in adulthood. Studies about the use of homeopathic ultra-high dilutions as tools to minimize stress are found in the literature, i.e. Zincum metallicum is used for the treatment of neurological and behavioral symptoms, including: weakening of intellectual functions with brain and nervous exhaustion, loss of vitality, slow comprehension, memory disorder, general tremor and constant movements. These alterations can be characterized as stress-related phenomena in different species.

Aim: The aim of this study was to evaluate the long-term effects of homeopathic treatment in animals subjected to stress in their early days (maternal deprivation). This study was approved by the Ethics Committee of the University of Santo Amaro (UNISA), according to Process number 11/2014.

Materials and Methods: In this study, newborn female rats were subjected to maternal deprivation and treated from the 10th day of lactation (PND10) until weaning (PND21). The animals were divided in 4 groups: 8 treated with Zincum metallicum 30 cH (Zn30cH); 8 treated with Zincum metallicum 6 cH (Zn6cH); 8 treated with 10% hydroalcoholic solution (medicines in blind trials, identified by codes); and 8 animals who had neither taken anything (“blank control”) nor experienced deprivation. The animals were weighed weekly, from weaning until the end of the experiment, and evaluated in the Open Field (OF) and in the Plus Maze (PM) devices to measure mobility, emotionality and anxiety, in 3 moments: in PND21 (childhood), during puberty (PND 40) and adulthood (PND75). Data were analyzed statistically by ANOVA, followed by the Bartlett’s Test and Bonferroni’s Multiple Comparison Test, being p≤0.05.

Results and Discussion: In the OF, it was observed reduction of immobility in Zn6cH group (p≤0.05) at PND21. At PND40, the Zn30cH group showed higher activity than the other groups, with increased rearing and decreased immobility (p≤0.05). Finely, at PND75 (adulthood) no change occurred, and Zincum metallicum treated rats presented similar behavior to the undeprived animals. In the PM, at PND21, the Zn30cH treated deprived group showed decrease in the open arm entry and retention period in the Maze, compared to the control undeprived group (p≤0.05). The time in the closed arm was higher than the undeprived control group and the number of head dips was lower (p≤0.05). The PM observation at 45 and 75 days showed no statistical difference among groups. The deprived animals which took Zn30cH obtained the same gain that the undeprived animals did (p≤0.05). Therefore, the deprived animals that presented anxiety during childhood were in accordance to other studies, showing that maternal deprivation is a stress factor that causes anxiety. However, the time of emotional unbalance was shorter in rats treated with Zincum metallicum.

Conclusion: Zincum metallicum 30 cH seems to be a potential medicine to manage troubles in the childhood derived from stress caused by maternal deprivation. However, other studies are already underway with male offspring and neurochemical measurements, for a better parameter of results.

Keywords: homeopathy, high dilutions, zincum metallicum, stress, anxiety, maternal deprivation