

عنوان مقاله:

Effect of prenatal exposure to stress and extremely low-frequency electromagnetic field on hippocampal and serum BDNF levels in male adult rat offspring

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نویسندگان:

Hajar Abkhezr - Tabriz University of Medical Sciences, Tabriz, Iran

Shirin Babri - Tabriz University of Medical Sciences, Tabriz, Iran

Mahsa Farid Habibi - Shahid Beheshti University of Medical Sciences, Tehran, Iran

Fereshteh Farajdokht - Tabriz University of Medical Sciences, Tabriz, Iran

Saeed Sadig-Etegad - Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

Gisou Mohaddes - Neurosciences Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

خلاصه مقاله:

Objective(s): Prenatal stress (PS) can adversely affect cognitive and psychological functions in the offspring. This study aimed to determine the effect of PS and extremely low-frequency electromagnetic field (ELF-EMF) on spatial memory, serum corticosterone, brain-derived neurotrophic factor (BDNF) concentrations, and hippocampal BDNF levels in adult male offspring. Materials and Methods: Female Wistar rats were randomly divided into four groups (n=6): Control, Stress, ELF-EMF (exposure to ELF-EMF), and S+EMF (simultaneous exposure to stress and the ELF-EMF) groups. Animals received interventions for 21 days before and 21 days during pregnancy (a total of 42 days). On the offspring's 90th postnatal day (PND), spatial memory was tested using Morris Water Maze, serum Corticosterone and BDNF levels were measured by the ELISA method, and hippocampal BDNF levels were measured by Western blotting. Results: PS did not affect spatial memory in the adult male offspring; however, it significantly ( $P < 0.05$ ) increased serum corticosterone levels compared to the control and EMF groups. Simultaneous induction of stress with ELF-EMF disrupted the memory acquisition phase. Serum and hippocampal BDNF levels increased significantly ( $P < 0.05$ ) in the EMF group compared to the stress group. Conclusion: Based on our findings, PS can increase serum corticosterone levels without affecting spatial memory. However, induction of ELF-EMF with stress has a destructive effect on spatial memory with no change in the corticosterone levels. Compared to stress, prenatal exposure to ELF-EMF increases serum and hippocampal BDNF levels. Further studies are needed to determine the underlying mechanisms of these findings.

کلمات کلیدی:

BDNF, Corticosterone, ELF-EMF, Prenatal stress, Spatial Memory

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