

Protective and restorative effects of melatonin and coenzyme Q against propionic acid-induced biochemical autistic features in rat pups

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Backgrounds: Exposures to environmental toxins are now thought to contribute to the development of autism as a neurodevelopmental disorder. Results from animal studies may guide investigations of human populations toward identifying environmental contaminants and drugs that produce or protect from neurotoxicity and may help in the treatment of neurodevelopmental disorders like autism.

Objective: To study the protective and restorative effects of melatonin and coenzyme Q on brain intoxication induced by propionic acid (PPA) in rats.

Methods: 48 young male western albino rats were enrolled in the present study. They were grouped into six equal groups each of 8 rats. First group received a neurotoxic dose (250 mg/kg body weight/day for 3 days) of buffered PPA. The second group consisted of rats to which only phosphate buffered saline was administered and was used as a control group. The third and fourth groups were treated with coenzyme Q (4.5 mg/kg body weight) or melatonin (10mg/kg body weight) for one week after being intoxicated with the PPA as described above (therapeutically treated groups). Fifth and sixth groups were treated with either coenzyme Q or melatonin for one week followed by PPA intoxication (protected groups). Gamma amino-butyric acid (GABA), serotonin, dopamine, interferon γ -inducible protein 16 and oxytocin together with comet DNA assay were measured in brain tissues of the six studied groups.

Results: The obtained data showed that PPA caused multiple signs of brain toxicity as measured by depletion of GABA, serotonin, and dopamine as three important neurotransmitters that reflect brain function, interferon γ -inducible protein 16 and oxytocin. A high significant increase of tail length, tail DNA % damage and tail moment as three comet DNA assay parameters were reported as genotoxic effect of PPA. Melatonin and coenzyme Q showed protective and restorative effects on PPA - induced changes in rats as there was a remarkable amelioration of most of the measured parameters.

Conclusion: In conclusion, melatonin and coenzyme Q, as confirmed by biochemical assays and DNA double strand breaks markers, has potential protective and restorative effects against PPA-induced brain injury.

Biography

Afaf El-Ansary is a Biochemist, graduated from Biochemistry department, Ain Shams University, Egypt in 1974. She worked in the National Research Centre, Egypt from 1976-2000. Since 2001, she is working in Biochemistry Department, King Saud University, KSA. She has published more than 45 papers related to metabolic integration between schistosome parasite and molluscan hosts. She recorded a patent on the "use of sublethal concentration of *Solanum nigrum* plant for the control of schistosomiasis". She was recognized by the Marquis Who's Who in science and engineering, Eight's edition, 2005-2006. She is member in number of national and international societies and she is recorded as reviewer in many international journals. In recent years, she focused on the screening of biochemical markers related to autism and she got about 40 published papers in high impact factor journals.

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