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Effect of low-intensity 900 MHz frequency electromagnetic radiation on rat brain redox status and cholinesterase activity linked to working memory

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Statement of the Problem: Behavioural impairments are the most empirical consequence of long-term mobile uses, but the underlying causes are still poorly understood. Until now no study has been proposed to investigate the underlying causes of behavioural effects induced by microwave exposure. Thus, the present study was undertaken to determine the influence of microwave radiation on redox status, oxidative stress, cholinesterase activity, DNA damage and cognitive alterations in rat brain.

Methodology & Theoretical Orientation: The study was carried out on 24 male Wistar rats, randomly divided into four groups (n=6 in each group): Group I consisted of sham exposed (control) rats, group II, III and IV consisted of rats exposed to microwave radiation (900 MHz) at different time duration 1h, 2h and 4h respectively (5 days/week). Rats were sacrificed and decapitated to isolate.

Findings: Microwave exposure resulted in a time dependent significant increase in oxidative stress markers viz. malondialdehyde (MDA) and catalase (CAT) in microwave exposed groups in comparison to sham exposed group ($p<0.05$). But, the levels of superoxide dismutase (SOD) were found significantly decreased in microwave exposed groups ($p<0.05$). A significant alteration in redox status was observed in microwave exposed animals ($p<0.05$). Furthermore, significant depletion in cholinesterase activity and DNA damage was also observed in microwave exposed groups as compared to their corresponding values in sham exposed group ($p<0.05$).

Results: In conclusion, the present study suggests that microwave radiation induces oxidative stress, depleted redox status, DNA damage and reduces working memory in brain by exerting a time dependent effect.

Biography

Samta Sharma is a Research Associate in an ICMR funded project. She has completed her Doctorate in Life Sciences. She has published scientific paper and a book, also has got awards in conferences.

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