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The impact of extremely low frequency-electromagnetic fields and light at night (LAN) on estradiol (E2) levels, oxidative stress and DNA configuration in female night shift workers

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Every living being on this planet is tuned into the earth's electromagnetic fields (EMFs) and uses them for various pur¬poses. Human bodies are essentially very sensitive electromagnetic systems; they also emanate electromagnetic fields around. Since last four decades the effects of electromagnetic fields on biological systems have been extensively investigated. The reports are controversial and inconclusive as well. There is hardly any study on estrogen hormone which plays a vital role in sustaining the homeostatic mechanism pertaining to DNA integrity. The aim of the study is to assess the effect of estrogen hormone on exposure to electromagnetic fields and light at night (LAN). Other parameters like oxidative stress and DNA damage and DNA integrity are also included in the present study to rule out the controversy prevailing regarding the influence of EMFs and LAN on the risk of breast cancer. Blood samples from 400 night shift working women were collected at 8 am and the serum was analyzed for estradiol hormone level by chemiluminescence immunoassay (CLIA) method. DNA damage was studied in exposed and control subjects using single cell gell electrophoresis. Oxidative stress was estimated by measuring levels of plasma malonyl dialdehyde (MDA) and serum nitric oxide (NO). The analysis showed significant increase ($p<0.0001$) in estradiol hormone level in exposed, when compared to controls. There was a significant increase in DNA damage ($p<0.05$). The plasma MDA levels also demonstrated the same observation. Our findings lead us to summarize that electromagnetic fields and light at night (LAN) elevated the estrogen levels, which suggest that these increased levels and the DNA and oxidative stress could possibly be the risk factors in urbanized night shift female workers.

Biography

Ravindra Tiwari has completed her Ph.D in 1987 from Osmania University. She has 38 years of experience in research, evaluation, teaching and administration in education institutions. She has memberships in Red Cross Society, Nirdosh Social Service Organization and MASI (Microwave Association Society of India). She is a Research Supervisor at Osmania University & JNTUH. She is currently working as a Principal at GIET, India.

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