

Effects of 60-Hz Magnetic Field Exposure on Nocturnal 6-Sulfatoxymelatonin, Estrogens, Luteinizing Hormone, and Follicle-Stimulating Hormone in Healthy Reproductive-Age Women: Results of a Crossover Trial.

SCOTT DAVIS, PHD, DANA K. MIRICK, MS, CHU CHEN, PHD,
AND FRANK Z. STANCZYK, PHD

Purpose: Exposure to residential magnet fields may disrupt the normal nocturnal rise in melatonin levels, resulting in increased risk for breast cancer, possibly through increased levels of reproductive hormones. We investigated whether exposure to a 60-Hz magnetic field under controlled conditions is associated with a decrease in urinary nocturnal 6-sulfatoxymelatonin level and increase in luteinizing hormone (LH), follicle-stimulating hormone (FSH) and estrogen levels in healthy premenopausal women.

Methods: Using a crossover design, half the participants were assigned to magnetic field exposure of 5 to 10 mG greater than ambient levels for 5 consecutive nights during the early to midluteal phase of the menstrual cycle. On the last night of exposure, a nocturnal urine sample was collected. The next month, participants were sham exposed. The other half of participants were assigned the reverse order of exposure.

Results: Magnet field exposure was associated with decreased 6-sulfatoxymelatonin levels, but no changes in reproductive hormone levels were observed. Participants using prescription medications and anovulatory participants had more pronounced decreases in 6-sulfatoxymelatonin levels with magnetic field exposure.

Conclusions: This study provides further evidence that exposure to magnetic fields is associated with decreased nocturnal melatonin levels, but does not support the hypothesis that such exposure results in increased urinary levels of estrogens, LH, or FSH.

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