

Occupational Magnetic Field Exposure and Neurodegenerative Disease

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Editors' note: an invited commentary on this article appears on page 384.

Background:

Several studies have identified occupational exposure to extremely low-frequency electromagnetic fields (EMF) as a potential risk factor for neurodegenerative disease, but the evidence is contradictory and inconclusive

Methods:

We conducted a cohort study to explore these associations. We studied all economically active individuals in the Swedish 1980 census (4,812,646 subjects), and followed them for neurodegenerative disease mortality from 1981 through 1995. Information about occupation was available for 1970 and 1980. A job-exposure matrix based on magnetic field measurements was used to assess EMF exposure

Results:

An increased risk of Alzheimer's disease mortality was observed among men exposed both in 1970 and 1980 (relative risk = 2.3; 95% confidence interval = 1.6-3.3 for exposure $\geq 0.5 \mu\text{T}$). The associations were most pronounced for early-onset Alzheimer's disease mortality or with follow-up limited to 10 years after the last known occupation. Amyotrophic lateral sclerosis was not associated with EMF exposure, but the risk estimate with "electrical and electronics work" was 1.4 (95% confidence interval = 1.1-1.9)

Conclusions:

Our study gives some support to the hypothesis that EMF exposure increases the risk of early-onset Alzheimer's disease, and suggests that magnetic field exposure may represent a late-acting influence in the disease process. Electric shock is an unlikely explanation for the increased risk of amyotrophic lateral sclerosis in "electrical and electronics work" in this study.

Key Words Alzheimer's disease; amyotrophic lateral sclerosis; electromagnetic fields; neurodegenerative disease; occupation

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