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Neurodegenerative Diseases in Welders and Other Workers Exposed to High Levels of Magnetic Fields

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Background:

Previous work has suggested an increase in risk of amyotrophic lateral sclerosis (ALS) and Alzheimer's disease among workers exposed to extremely low-frequency magnetic fields (ELF-MF). We evaluated the relation between ELF-MF from occupational exposures and mortality from neurodegenerative diseases.

Methods:

The study was based on a cohort of Swedish engineering industry workers, comprising 537,692 men and 180,529 women. The cohort was matched against the 3 most recent censuses and The Causes of Death Registry. Levels of ELF-MF exposure were obtained by linking occupation according to the censuses to a job exposure matrix. We used 4 levels of exposure and considered both the primary and contributing causes of death, 1985-96.

Results:

The risk of Alzheimer's disease as primary or contributing cause of death increased with increasing exposure to ELF-MF among both men and women, with a relative risk (RR) of 4.0 and a 95% confidence interval (95% CI) of 1.4-11.7 in the highest exposure group for both sexes combined. There was a RR of 2.2 (95% CI: 1.0-4.7) for ALS in the highest exposure group with the suggestion of an exposure-response relationship. No evidence of increased risk was seen for Parkinson's disease or multiple sclerosis.

Conclusions:

The findings support previous observations of an increased risk of Alzheimer's disease and ALS among employees occupationally exposed to ELF-MF. Further studies based on morbidity data are warranted.

Key Words Alzheimer's disease; Amyotrophic Lateral Sclerosis; Electromagnetic Fields; Neurodegenerative Disease; Occupation

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