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Radio-Frequency Radiation Exposure from AM Radio Transmitters and Childhood Leukemia and Brain Cancer.

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Leukemia and brain cancer patients under age 15 years, along with controls with respiratory illnesses who were matched to cases on age, sex, and year of diagnosis (1993-1999), were selected from 14 South Korean hospitals using the South Korean Medical Insurance Data System. Diagnoses were confirmed through the South Korean National Cancer Registry. Residential addresses were obtained from medical records. A newly developed prediction program incorporating a geographic information system that was modified by the results of actual measurements was used to estimate radio-frequency radiation (RFR) exposure from 31 amplitude modulation (AM) radio transmitters with a power of 20 kW or more. A total of 1,928 leukemia patients, 956 brain cancer patients, and 3,082 controls were analyzed. Cancer risks were estimated using conditional logistic regression adjusted for residential area, socioeconomic status, and community population density. The odds ratio for all types of leukemia was 2.15 (95% confidence interval (CI): 1.00, 4.67) among children who resided within 2 km of the nearest AM radio transmitter as compared with those resided more than 20 km from it. For total RFR exposure from all transmitters, odds ratios for lymphocytic leukemia were 1.39 (95% CI: 1.04, 1.86) and 1.59 (95% CI: 1.19, 2.11) for children in the second and third quartiles, respectively, versus the lowest quartile. Brain cancer and infantile cancer were not associated with AM RFR.

PMID: 17556764 [PubMed - as supplied by publisher]

http://www.ncbi.nlm.nih.gov/pubmed/8985435

Med J Aust. 1996 Dec 2-16;165(11-12):601-5.

Erratum in:
Med J Aust 1997 Jan 20;166(2):80.
Comment in:
Med J Aust. 1996 Dec 2-16;165(11-12):599-600.

Cancer incidence and mortality and proximity to TV towers.

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OBJECTIVE: To determine whether there is an increased cancer incidence and mortality in populations exposed to radiofrequency radiations from TV towers.

DESIGN: An ecological study comparing cancer incidence and mortality, 1972-1990, in nine municipalities, three of which surround the TV towers and six of which are further away from the towers. (TV radiofrequency radiation decreases with the square of the distance from the source.) Cancer incidence and mortality data were obtained from the then Commonwealth Department of Human Services and Health. Data on frequency, power, and period of broadcasting for the three TV towers were obtained from the Commonwealth Department of Communications and the Arts. The calculated power density of the radiofrequency radiation in the exposed area ranged from 8.0 microW/cm2 near the towers to 0.2 microW/cm2 at a radius of 4km and 0.02 microW/cm2 at 12 km.

SETTING: Northern Sydney, where three TV towers have been broadcasting since 1956.

OUTCOME MEASURES: Rate ratios for leukaemia and brain tumour incidence and mortality, comparing the inner with the outer areas.

RESULTS: For all ages, the rate ratio for total leukaemia incidence was 1.24 (95% confidence interval [CI], 1.09-1.40). Among children, the rate ratio for leukaemia incidence was 1.58 (95% CI, 1.07-2.34) and for mortality it was 2.32 (95% CI, 1.35-4.01). The rate ratio for childhood lymphatic leukaemia (the most common type) was 1.55 (95% CI, 1.00-2.41) for incidence and 2.74 (95% CI, 1.42-5.27) for mortality. Brain cancer incidence and mortality were not increased.

CONCLUSION: We found an association between increased childhood leukaemia incidence and mortality and proximity to TV towers.

http://www.ncbi.nlm.nih.gov/pubmed/15369273

Arch Environ Health. 2003 Sep;58(9):560-4.

Decreased survival for childhood leukemia in proximity to television towers.

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Previously, an increased risk of childhood leukemia was identified among children who resided in an inner ring (radius -4 km) of 3 municipalities surrounding television towers, compared with children who resided in an outer ring (radius approximately 4-12 km) of 6 municipalities surrounding, but farther away from, the towers, which are situated in North Sydney, Australia. In the current study, the authors examined the survival experience of these children for all childhood leukemias, and for acute lymphatic leukemia (International Statistical Classification of Diseases and Related Health Problems, 9th revision [ICD-9] rubric 204.0) in particular. Of 123 cases of acute lymphatic leukemia, 29 cases (16 of whom died) were in the inner ring of municipalities nearest the towers, and 94 cases (34 of whom died) occurred in the outer, more-distant ring. There was a significant difference in survival rates between the 2 groups (log-rank test, $p = 0.03$; Wilcoxon, $p = 0.05$). The 5-yr survival in the inner ring of municipalities was 55%, and in the outer ring was 71% (i.e., subjects in the inner ring were 23% less likely to survive than those in the outer ring); at 10 yr, survival in the inner and outer rings was 33% and 62%, respectively. Following adjustment, the mortality rate ratio that the authors used to compare the inner ring with the outer ring was 2.1 (95% confidence interval = 1.1, 4.0). There was an association between residential proximity to the television towers and decreased survival among cases of childhood leukemia in North Sydney, Australia.

Am Ind Hyg Assoc J. 1995 Feb;56(2):189-92.

Time-dependent hematological changes in workers exposed to electromagnetic fields.

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A World War II-era study, involving the effects of electromagnetic fields (EMFs) emanating from radars and high-frequency radios on the blood of exposed workers, was analyzed for evidence of the effect of time in the manifestation of changes in the hematological system. Statistically significant correlations between increasing white blood cell count and average daily exposure, months of exposure, and total duration of exposure to EMFs were found. Changes in cell count were within the normal range, and thus their relation to epidemiological studies linking EMFs and leukemia, if any, is unclear. Results suggest that the time of exposure may be an additional factor (along with field strength, and perhaps frequency) in ascertaining the safety of EMF exposure.

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http://www.ncbi.nlm.nih.gov/pubmed/2858681

Lancet. 1985 Apr 6;1(8432):812.

Silent keys: leukaemia mortality in amateur radio operators.

Milham S Jr.

No abstract available

http://www.ncbi.nlm.nih.gov/pubmed/3422125

Am J Epidemiol. 1988 Jan;127(1):50-4.

Increased mortality in amateur radio operators due to lymphatic and hematopoietic malignancies.

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To search for potentially carcinogenic effects of electromagnetic field exposures, the author conducted a population-based study of mortality in US amateur radio operators. Ascertainment of Washington State and California amateur radio operators (67,829 persons) was done through the 1984 US Federal Communications Commission Amateur Radio Station and/or Operator License file. A total of 2,485 deaths were located for the period from January 1, 1979 through December 31, 1984, in a population of amateur radio operators which accumulated 232,499 person-years at risk. The all-cause standardized mortality ratio (SMR) was 71, but a statistically significant increased mortality was seen for cancers of the other lymphatic tissues (SMR = 162), a rubric which includes multiple myeloma and non-Hodgkin's lymphomas. The all-leukemia standardized mortality ratio was slightly, but non significantly, elevated (SMR = 124). However, mortality due to acute myeloid leukemia was significantly elevated (SMR = 176).

http://www.ncbi.nlm.nih.gov/pubmed/3189292

Am J Epidemiol. 1988 Nov;128(5):1175-6.

Mortality by license class in amateur radio operators.

Milham S Jr.

No abstract available

http://www.ncbi.nlm.nih.gov/pubmed/4085433

Environ Health Perspect. 1985 Oct;62:297-300.

Mortality in workers exposed to electromagnetic fields.

Milham S Jr.

In an occupational mortality analysis of 486,000 adult male death records filed in Washington State in the years 1950-1982, leukemia and the non-Hodgkin's lymphomas show increased proportionate mortality ratios (PMRs) in workers employed in occupations with intuitive exposures to electromagnetic fields. Nine occupations of 219 were considered to have electric or magnetic field exposures. These were: electrical and electronic technicians, radio and telegraph operators, radio and television repairmen, telephone and power linemen, power station operators, welders, aluminum reduction workers, motion picture projectionists and electricians. There were 12,714 total deaths in these occupations. Eight of the nine occupations had PMR increases for leukemia [International Classification of Diseases (ICD), seventh revision 204] and seven of the nine occupations had PMR increases for the other lymphoma category (7th ICD 200.2, 202). The highest PMRs were seen for acute leukemia: (67 deaths observed, 41 deaths expected; PMR 162), and in the other lymphomas (51 deaths observed, 31 deaths expected; PMR 164). No increase in mortality was seen for Hodgkin's disease or multiple myeloma. These findings offer some support for the hypothesis that electric and magnetic fields may be carcinogenic.

Ph. Hug remark : study done in 1985. We are in 2009 ! ! !

http://www.ncbi.nlm.nih.gov/pubmed/15338224

Int Arch Occup Environ Health. 2004 Aug;77(6):387-94. Epub 2004 Jul 31.

Ecological study on residences in the vicinity of AM radio broadcasting towers and cancer death: preliminary observations in Korea.

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OBJECTIVES: Public health concern about the health effects of radio-frequency electromagnetic fields (RF-EMFs) has increased with the increase in public exposure. This study was to evaluate some health effect of RF exposure by the AM radio broadcasting towers in Korea.

METHODS: We calculated cancer mortality rates using Korean death certificates over the period of 1994-1995 and population census data in ten RF-exposed areas, defined as regions that included AM radio broadcasting towers of over 100 kW, and in control areas, defined as regions without a radio broadcasting tower inside and at least 2 km away from the towers.

RESULTS: All cancers-mortality was significantly higher in the exposed areas [direct standardized mortality rate ratio (MRR) = 1.29, 95%CI = 1.12-1.49]. When grouped by each exposed area and by electrical power, MRRs for two sites of 100 kW, one site of 250 kW and one site of 500 kW, for all subjects, and for one site of 100 kW and two sites of 250 kW, for male subjects, showed statistically significant increases without increasing trends according to the groups of electric power. Leukemia mortality was higher in exposed areas (MRR = 1.70, 95% CI = 0.84-3.45), especially among young adults aged under 30 years (0-14 years age group, MRR = 2.29, 95% CI = 1.05-5.98; 15-29 age group, MRR = 2.44, 95% CI = 1.07-5.24).

CONCLUSIONS: We observed higher mortality rates for all cancers and leukemia in some age groups in the area near the AM radio broadcasting towers. Although these findings do not prove a causal link between cancer and RF exposure from AM radio broadcasting towers, it does suggest that further analytical studies on this topic are needed in Korea.