

P-429

DEVELOPMENT OF A MODEL OF B ACUTE LYMPHOBLASTIC LEUKEMIA FOR THE INVESTIGATION OF THE POTENTIAL LEUKEMOGENIC EFFECTS OF 50 HZ MFS

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Over the past 25 years, a possible association between exposure to extremely low frequency magnetic fields (50 Hz MFs) and cancer has been extensively studied. The most consistent data were found for B acute lymphoblastic leukaemia in children that represents the most common type of cancer encountered in childhood. However, controversial results were reported in epidemiologic studies about this potential adverse effect of 50 Hz MFs.

Therefore, we developed an animal model of B acute lymphoblastic leukaemia to investigate the possible co-initiating or promoting effects of 50 Hz MFs on the incidence of leukaemia in children. In this model leukaemia was chemically induced in male WKAH/Hkm rats by a nitrosourea derivative, N-butyl nitrosourea (BNU) administered 5 days a week for 24 weeks. Development of leukaemia was monitored by clinical observation, follow-up of blood parameters and appearance of blasts cells in serially repeated peripheral blood samples. The phenotype of the leukaemia in the affected rats was determined by cytological examination and cytochemical reactions on blood and bone marrow cells and, by immunophenotyping of bone marrow cells using various markers. Leukaemia occurred in 60% of BNU treated rats. Among the leukaemic rats, 65% developed B acute lymphoblastic leukaemia. The maximum of leukaemia development was observed between the 5th to the 8th month following the beginning of BNU treatment. Using this model, we decided to investigate the potential co-initiating or promoting effects of 50 Hz MFs. The possible effects of harmonics (150, 250 and 350 Hz) that pollute the electrical network are also studied. The total number of leukaemia and the phenotype of leukaemia obtained will be compared between the BNU treated animals exposed to 50 Hz MFs with or without harmonics and the animals treated with BNU alone.

We believe that the results of this experiment might be helpful to answer the question of whether or not 50 Hz MFs exert co-initiating or promoting effects on the development of B acute lymphoblastic leukaemia in children.