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Comparison of EMF standard and EMF research in China

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The exposure limits of EMF in China are stricter than that in Europe and America. At present in China administrative EMF standards are ‘Hygienic standard for environmental electromagnetic waves’(GB8702-88), ‘Regulations for electromagnetic radiation protection’(GB9175-88), and ‘Technical regulations on environmental impact assessment of electromagnetic radiation produced by 500kV ultrahigh voltage transmission and transfer power engineering.’ (HJ/T 24-1998). The new standard “Limits for Human Local Exposure to Electromagnetic Fields Emitted by Wireless Communication Terminals” will be issued on June, 2006. In this paper, EMF exposure limits and recent EMF research of China (1994-2004) were compared and analyzed.

For power frequency EMF, epidemiological studies showed that 50Hz EMF might have effects on the function of immune, cardiovascular, and the CNS. Questionnaires found that memory loss, bad attention, bald, insomnia, and less libido, etc. are the most complaints, medical examinations found that 50Hz EMF might result in abnormal ECG and down-regulation of immune globin; and the spot measurements of EMF exposure in the controlled environment got lower intensities in most operating positions for workers (lower than the EMF exposure limit of China). Although the exposure level were higher than the EMF standard, animal studies showed that 50Hz EMF might have some effects on animal study, memory, brain neurotransmitters, apoptosis of lymphocytes and immune function; in vitro studies found that 50Hz EMF might have biological effects by the interference of cell proliferation, apoptosis, DNA duplication, GJIC, and membrane ion channel activity, etc.

EMF research in Health effects of broadcasting, television, mobile phone, radar, and communication microwave found that RF might disturb the function of the CNS, immune, and cardiovascular system, RF might result in cataract and genetic toxicity to

operators. Epidemiological studies showed that low intensity RF exposure (lower than EMF standard, $<10 \mu \text{W}/\text{cm}^2$) might have effects on human neurobehavior, neurasthenia, cataract, and sperm development; low intensity RF might result in abnormal of ECG, EEG, and rCBF, and low intensity RF might increase the rate of mutation and micro nuclei in lymphocytes.

Animal studies showed that RF might have effects on animal ability of study, memory and male reproduction; RF might disturb the elimination ability of free radicals and the regulating ability of brain neurotransmitters. In vitro studies found that RF might down regulate the cytochrome oxidase activity of neurons and might damage the retention of brain, it implies that RF might have some relation with Alzheimer's dementia.

To sum up, recent ten years (1994-2004) epidemiological studies in EMF in China found that low intensity EMF might have some bad effects on health, and what should be highly concerned is that some bad effects were caused by exposure lower than the present EMF limit. As above mentioned, precaution strategy should be adopted when amending and prescribing new exposure limit for the public.

Key Words: EMF; Standards; Health effects