

IMMUNOHISTOCHEMICAL STUDIES OF SKIN CHANGES IN SO-CALLED "SCREEN DERMATITIS" WITH SPECIAL REFERENCE TO NEUROCHEMICAL MARKERS. Olle Johansson*, Marita Hilliges*, Lixin Wang*, Peng Yue Liu* and Gunilla Holmkvist* (SPON: Professor Bengt Knave, Arbetsmiljöinstitutet, Solna, Sweden). Experimental Dermatology Unit, Department of Neuroscience, Karolinska Institute, Stockholm, Sweden.

Recently, a new category of patients has been described in the literature, namely those that claim to suffer from subjective and objective skin- and mucosa-related symptoms, such as itch, smarting, pain, heat sensation, redness, papules, pustules, etc., after exposure to VDTs as well as other electromagnetic devices, both at their work and in their home. Some patients also have symptoms from internal organ systems, such as the heart and the central nervous system. Clinical dermatologists often describe these patients as suffering from either some kind of earlier acknowledged skin disease, e.g. seborrheic keratosis or rosacea, or from so-called 'techno-stress', a term first used in Japan for work-related stress. Also Pavlovian-type conditioning has been attributed to this group of patients. So far, however, very little is known about the exact cause of the above-mentioned symptoms and, thus, generally very little treatment can be offered. The aim of the on-going study is to investigate possible changes, in the cellular and neuronal systems of the human skin, after provocations with electric and/or magnetic VDT-fields. As controls, age- and sex-matched persons working with VDTs (however, without any subjective or clinical symptoms) will serve. Immunohistochemistry using antisera to the previously characterized marker substances of interest in this specific patient category is utilized. Among these markers, PGP 9.5, S-100, γ -MSH, PNMT, CGRP, VIP, NPY, PHI and ChAT, may be mentioned. Initially, we have done the following: a) Investigated the presence of intraepidermal nerve fibers in normal human skin from healthy volunteers using the new marker PGP 9.5. The intraepidermal nerve fibers are found as close as 20-40 μ m from the surface, which makes it highly possible that weak electromagnetic fields may affect them. They have also been further characterized using conventional electron microscopy as well as ultrastructural immunocytochemistry. b) Performed a 'pilot'-study to elucidate possible changes in cellular (immunologic, connective tissue, etc.) markers, as well as in sensory and autonomic nerve fibers. From the preliminary data, it seems plausible to conclude that the patient population differs from both healthy controls as well as from rosacea patients, however, further control experiments needs to be carried out. c) Studied, in collaboration with the Karolinska Hospital (prof. K. Hall, Dept. Endocrinol. & dr. V. Björnhagen, Dept. Plast. Surg.), in an open-field situation, the effect of EMFs from an ordinary TV set on the cellular/neuronal populations of the skin of sampled patients. From these studies, it is evident that certain profound effects in the dermis and epidermis take place, however, since the material still is small further investigations are needed. d) Investigated the presence of mast cells in skin from patients using histamine-based immunohistochemistry. From these studies, it seems as if the patients have a higher number of mast cells in their affected areas, however, again, the material needs to be further extended. In summary, it is evident from our preliminary data that major biological effects may be present in the patients suffering from EMF exposure. In view of the recent epidemiological studies pointing to a correlation between long-term exposures from magnetic fields and cancer [1, 2], our data ought to be further analyzed. (Supported by the Swedish Work Environment Fund (proj. no. 93-0344), NCE AB Salora Displays and funds from the Karolinska Institute.)

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