
LETTERS TO THE EDITOR

Video computer terminals and occupational dermatitis

There are no reports on skin sensitivity to video computer terminals. Weiss & Petersen (2) found that the level of radiation from such terminals was far below the permissible exposure level established by any agency or government. They concluded that there is no experimental or epidemiologic evidence which would indicate that levels of radiation attributable to video computer terminals have any deleterious effect on the human biological system.

Skorobogatova et al (1) found that static electric fields produced by technical processes in the textile, chemical and polygraphic industries will, under special circumstances, influence the function of vital organs in the human body. They stressed the fact that static electricity is inversely related to relative air humidity. At a temperature of 24—30°C and a relative air humidity of 50—55 % during exposure to static electricity in the range of 10—15,000 V/cm they found the potential of the skin of textile workers to be 6,000—10,000 V. Under these circumstances sweat production increased and skin resistance to the passage of electric current was lowered during a workday. They observed hypertension and bradycardia. Similar reactions were found in experiments with rabbits. They concluded that these biological changes were due to exposure to static electric fields which cause sympathetic and parasympathetic irritation with vegetative dysfunction. In addition the workers in question complained of formication.

This result is in harmony with the fact that some people react with itching when static electric fields are produced by thunderstorms. When one places a hand close

to a video computer terminal or a television screen, one feels pricking of the skin because of the discharge of static electricity. This phenomenon is also in harmony with our observation that users of video terminals may suffer from an intense pricking sensation of the skin of the face and those parts of the body not covered by clothing.

Thus far we have observed ten patients with dermatitis and itching, on the face, that have probably been caused by exposure to video terminals during the normal course of their work. The pricking sensation commenced after an exposure of 1—8 h and was, in the majority of cases, followed by erythema on the same site, as well as by small circumscribed areas of superficial solid elevation of the skin. Once away from work, the patients soon returned to normal. The rash would usually disappear during the weekend break, although a few individuals had to be absent from work for one or two weeks before the symptoms vanished completely. A majority of the patients had suffered from this complaint for years, its origin coinciding with exposure to video terminals. Occasionally a doctor had been consulted. One patient had done so on a regular basis, her rash having the form of perioral dermatitis. All of those affected maintained that the rash appeared mostly when the weather was dry and cold and it rarely appeared during rainy spells. We found marked individual differences in the sensitivity to the terminals however.

The first report of this complaint, ie, itching and erythema, was made to the Local Labour Inspection of Bergen, Norway, in the early spring of 1979. When the information was circulated through the mass media, it prompted reports of other cases in Bergen and other regions of Norway.

We visited many offices which used video terminals. In a majority of offices the complaint was unknown. When a comparison of ambient backgrounds was made, its occurrence appeared to be dependent upon certain common factors. Low air humidity — usually between 20 and 30 % — was one. Wall-to-wall carpeting without antistatic qualities was another. In all the cases static electricity, revealing itself through discharge from doorknobs, clothes, etc, was present.

The relationship between video terminals and the rash was established by means of provocation tests. In two sensitive users the rash was provoked in 6 and 8 h, respectively.

During the testing, to exclude ultraviolet radiation, the terminal was placed behind a sheet of ordinary window glass. This procedure did not prevent the skin reaction in question. On the contrary, in some cases it seemed to encourage it.

To exclude static electric induction, a waterscreen was used which consisted of two pieces of ordinary glass welded together, the space between being filled with a water and soda solution. It was grounded. The screen reduced the skin reactions. The same was true when a grounded metal-thread screen was used.

When air humidity was kept high — about 50 % — the reaction was reduced markedly. When felt carpets were replaced by antistatic ones and air humidity was maintained at a high level, there was no sign of the rash in any employee.

In one particular workplace the complaints worsened markedly when the carpets were replaced by antistatic ones. It was found that the worker had used ordinary glue under the new carpet, which made the carpet an insulator and thus concentrated the static electric field.

We now have, as far as two rather big workplaces are concerned, an observation time of four months with antistatic carpets and high air humidity. The workers maintain that the pricking sensation on the face and the erythema have vanished completely. A few still suffer from sweating on the front of the head and on the hands and from extrasystoles, as well as from general discomfort, when they are exposed to a video computer terminal for more than 2 h.

The picture on the video screen is produced by an intense bombardment of electrons in vacuum from an "electronic gun" on the inside of the fluorescent screen and by an electronically focused beam that is driven by potentials of 15—20,000 V. The beam scans the screen with 300 lines every fiftieth of a second and in the next fiftieth the other 300 lines, completing the whole picture of 600 lines every 0.045 s. Twice in each picture completion the picture is blacked-out for about 12 lines. This procedure produces a certain amount of picture flicker. It is well known that the flicker effect may produce eye fatigue, but there is no evidence that it can give rise to itching or erythema.

We have, by means of a van de Graaff machine, exposed four of the sensitive workers to a static electric field and thus provoked the characteristic rash and the pricking sensation of the skin. When the generator was switched off, the rash disappeared in the course of a few minutes, only to reappear when it was switched on again. On all four subjects the hair on their heads began to stand on end, as had been the case when they operated a video terminal.

There are various possibilities open in regard to the connection between electrostatic fields and the medical reactions observed. There are, for example, the so-called capillary electrical phenomena which occur between two layers of different conductivity when very weak currents are present. These phenomena appear because the surface tension of liquids is reduced during charging, regardless of whether the charge is positive or negative, and osmotic functions are therefore affected. Nor can the possibility of electrolytic changes in tissue be ruled out. Effects brought about via the vegetative nervous system also have to be taken into consideration.

There is obviously a need for further research as far as the influence of static electricity from video computer terminals on the human body is concerned.

References

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A Swedish cancer-environment register available for research

Motivation for the Cancer-Environment Register

Certain conditions in Sweden and the other Scandinavian countries furnish good opportunities for epidemiologic research on cancer. In the registration of cancer patients in the Swedish Cancer Register almost full coverage has been achieved (3, 4) and civil registration and other data sources enable a person to be traced.

The Cancer Register has, however, a number of shortcomings, the chief of them being the incompleteness of the information on occupation and place of domicile. The data relating to occupation are based on information that the patient furnishes on admission to the hospital, often at the reception desk. This is obviously not an occasion when either the patient or the hospital staff are likely to concern themselves with details of job and occupation. Reports to the Cancer Register are based on this information and are therefore often inconclusive on this point. In addition, until 1971 the place of domicile reported in the Cancer Register was not specific enough to be used in most epidemiologic studies.

It was decided to improve the information contained in the Cancer Register by merging it with a census. The 1960 census was selected for this purpose because it contains detailed information on occupation and place of domicile and includes other data which could be of interest in epidemiologic studies on the causes of cancer. The fact that the 1960 census was the first to be stored in an electronic retrieval system played an important role.

Reference was also made to the 1950 census, which has the advantage of offering a longer time lag between exposure and the actual manifestation of the disease.

Legal obstacles

Sweden has, as has many other countries, enacted strict and detailed legislation designed to protect the integrity and privacy of individuals registered in retrieval systems. Information in the Cancer Register of the National Board of Health and Welfare, in the 1960 census of the National Central Bureau of Statistics, and in the Total Population Register — essential factors in the establishment of the Cancer-Environment Register — is subject to this legislation, and approval of the Data Inspection Board was required to merge information from these registers. After a series of discussions the National Board of Health and Welfare and the National Central Bureau of Statistics drew up an agreement in November 1976 clarifying the forms which mutual cooperation would take, provided the Data Inspection Board authorized the establishment of the Cancer-Environment Register.

According to the terms of this agreement data from the Register can be released for scientific and research purposes, including epidemiologic studies. A special committee was formed within the National Board of Health and Welfare to include members of both agencies. This committee must be responsible for dealing with the disclosure of information and is required to ensure that adequate precautions are taken to maintain secrecy and to prevent the unauthorized disclosure of information.

Before the merging operation and the release of information from the Register for research work, a detailed check was made of the identity of persons in the Cancer Register.

Correction of personal identities in the Cancer Register before the merging operation

The Cancer Register for the period 1961—1973 contains about 385,000 persons, and the 1960 census about 7,500,000. Every person living in Sweden has an individual per-