

Patients with Visual Display Unit-related Facial Symptoms Are Stingers

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Thirty patients without obvious skin disease but with subjective skin symptoms related to work with visual display units (VDUs) and 32 healthy persons were single-blind-tested with a solution of 5% lactic acid and pure water on their cheeks. Thirteen of the patients and 6 control persons reacted positively as “stingers” ($p < 0.05$) in this objective test of sensitive skin. The reason why some patients react with subjective symptoms like itching, burning, stinging, prickling or tingling is unclear. The result of this study, that patients with VDU-related skin symptoms have sensitive skin, does not tell anything about the aetiology of the symptoms. Former studies speak against the role of electric and magnetic fields and indicate that “techno-stress”, cognitive factors or flickering from the VDUs or fluorescent tubes could be of importance, as could the Swedish mass media debate.

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An epidemic of patients with skin symptoms related to work with visual display units (VDUs) began in 1985, when 3 patients presented with skin problems appearing on one side of the face, the side which they turned toward a VDU (1). Histopathological examination revealed a picture which deviated from that of normal skin (1). The local health insurance agency accepted the assumption that there could be a causal relationship between the dermatitis and the work, and this decision was extensively reported upon by the news media. Afterwards, an increasing number of VDU-exposed people reported facial skin symptoms. However, an epidemiologic study showed that VDU-exposed subjects reported a higher incidence of subjective skin symptoms than a control group, but no increase in objectively visible signs or unilateral rashes (2). Nor did a controlled study from skin biopsies reveal any specific changes in the VDU-exposed group with facial skin symptoms (3). Furthermore, in seven different controlled, double-blind, provocation studies (1, 4–9) with a total of 140 patients, none of the patients were able to tell when the electromagnetic fields were turned on or off. Nevertheless, the patients exist, and they are convinced that electromagnetic fields hurt their skin. Their skin symptoms include itching, burning, stinging, prickling or tingling (10).

Non-allergic stinging reactions in facial skin have been studied mainly in patients sensitive to cosmetic products without positive patch test results (11–15). Their subjective symptoms (12) are similar to those mentioned above in patients with VDU-related skin symptoms. The sensitive skin in these patients is thought to be due to a “thin” stratum corneum barrier (11), a “defective” stratum corneum barrier (11, 15) or a direct neuronal influence (12).

The aim of the present study was to find out if the VDU patients are stingers, as a sign of a more sensitive skin.

PATIENTS AND METHODS

Thirty patients with VDU-related skin symptoms and 32 controls with healthy skin were enrolled in the study. The patients were recruited from a former study with stress provocations combined with VDU exposure (in preparation). They all had subjective facial skin symptoms, which they related to exposure to VDUs or other electric equipment. However, none of them could assess, in the double-blind experiment situation, whether or not they were exposed to real electromagnetic fields. They all had normal facial skin status, i.e. no facial skin diseases were found. Their subjective skin symptoms were described in various ways: tingling, itching, burning or stinging sensations. The controls were randomly selected, age- and sex-matched, with healthy skin, from the staff of the Department of Dermatology at Karolinska Hospital. The groups were equivalent with regard to age, gender, skin types (16), atopic diseases or family history of atopy.

The lactic acid tests were performed according to studies by Frosch & Kligman (11) and Lammintausta et al. (12). After cleaning the facial area below the eyes with soap and water, facial sweating was induced by exposure to a commercial facial sauna (Silhouet-Tone 50126, Canada) for 15 min. A solution of 5% of lactic acid in water was then applied with a swab in a gentle rotating motion to one side of the cheek from the side of the upper lip upwards across the cheek. Water was applied as a placebo control in the same manner to the opposite side. The studied persons were asked after 2, 4 and 5 min to describe the presence and intensity of any skin sensation. The following scale was used: 0 = none, 1 = slight, 2 = moderate, 3 = severe. If the cumulative score of the grades was 3 or more, the subject was considered a “stinger”.

The number of positive reactions in patients versus those in controls were compared with the use of the exact chi-square test. The total sum of scores for persons in the two groups was compared using the Mann-Whitney U test, and maximal scores in any of the three instances were compared with the use of the exact chi-square test. The groups were considered to differ significantly when $p < 0.05$.

RESULTS

Thirteen of 30 persons in the patient group and 6 of 32 subjects in the control group ($p < 0.05$) reacted positively as “stingers”. Two control persons and one patient had some kind of symptom from the placebo test with water. In calculations of the total sum of scores for persons in the two groups (Fig. 1) or the maximal score at any of the three times (Fig. 2), the groups also differed significantly ($p < 0.05$).

DISCUSSION

The study shows that patients with facial skin symptoms related to work with VDUs more frequently are stingers, although they do not have a visible skin disease. The lactic acid test is an objective skin test, which has formerly been shown to be useful in detecting patients sensitive to cosmetics without having a positive patch test. In this test the hydration of the skin with the facial sauna is essential to provoke

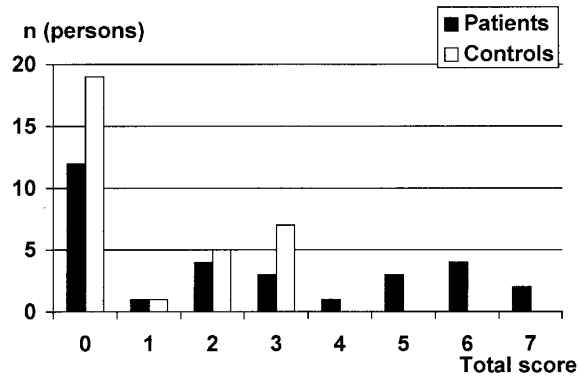


Fig. 1. The total sum of scores 2, 4 and 5 min after application of a solution of 5% of lactic acid to the cheek for persons in the patient group ($n=30$) with VDU-related skin symptoms and the control group ($n=32$).

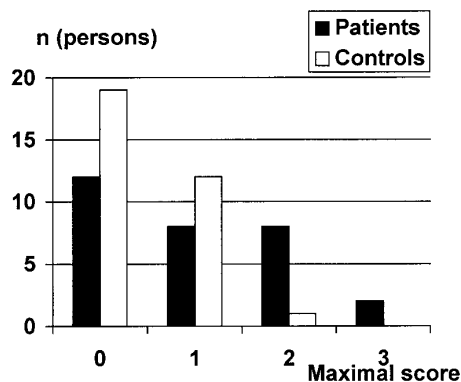


Fig. 2. Maximal score on any of the three occasions after application of a solution of 5% of lactic acid on the cheek for persons in the patient group ($n=30$) and the control group ($n=32$). VDU-related facial symptoms.

symptoms from lactic acid, while in our experience the concentration of lactic acid is of minor importance.

The results, showing that many of these patients are stingers, may indicate that the whole group of patients with VDU-related skin symptoms are stingers. The reasons for the appearance of these symptoms in the VDU environment are, however, doubtful. Earlier studies give no support to the hypothesis that electric and magnetic fields provoke the symptoms (1). Some results indicate that stress in the work-place (17), cognitive factors (9), or flickering from the VDU or from fluorescent tubes (18) are important factors. Another theory is that the Swedish mass media interest in the area is the cause of the epidemic (19). The fact that the patients are stingers could make them liable to react with skin symptoms from e.g. dry air or particles in the work environment, and the VDU is then blamed for provoking the symptoms.

The reason why some patients react with subjective skin symptoms without having any visible skin signs is still obscure. Lammintausta & Maibach (13) have found an increased frequency of stingers in the following groups: infants, women, elderly, persons with skin type I, a history of atopic dermatitis or dry skin. These stingers are thought to have a defective stratum corneum barrier (11, 15), and they have been shown

to have a lower skin pH than control persons after application of lactic acid to the skin (15). Further studies are needed to confirm the above-mentioned skin pH results, and also to explore the role of skin neuropeptides in stinging.

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