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Provocation of the electromagnetic distress syndrome

by Allan Toomingas, MD¹

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Background Many patients in Sweden are today distressed by fears of “electric fields.” This phenomenon was almost unknown to occupational health clinics 10 years ago.

Case history and examination A 35-year-old male plumber complained of fatigue, headache, lack of concentration, numbness and paresthesia in his arms, and a greasy feeling in his palms, where he observed tiny shiny spots. These symptoms made him unable to work. It all started after a period of high strain at the work. He feared negative influences, mainly from electric fields. Signs indicating nerve entrapment in the upper extremities were found in a clinical examination.

Provocation study The patient was blindly provoked in a whole-body electromagnetic coil at 34 or 100 μ T randomly mixed with sham exposures. After being blinded against irrelevant external cues, he was not able to detect the existence of or any symptoms at either field intensity. He was informed about the results and was later able to return to his previous work.

Conclusions No sensitivity to electromagnetic fields could be objectively verified for this patient, who was suspected to suffer from a thoracic outlet syndrome.

Key terms thoracic outlet syndrome.

Many patients in Sweden are distressed by fears of “electric fields.” This problem was almost unknown to occupational health clinics 10 years ago. The symptoms connected with exposure to 50-Hz fields are mainly dermal or neurological, such as headache, dizziness or weakness (1).

Case history and examination

One of the first cases for the examination and provocation of such distress was seen in 1987. The patient was a male plumber 35 years of age with earlier gastritis but with no known toxic exposure except smoking. He was unable to perform his work because of fatigue, headache, and lack of concentration. He also complained of numbness and paresthesia in his arms, primarily when working above shoulder level, and of a greasy feeling in the palms of his hands, where he observed tiny shiny spots. It all started after a period of high strain at work, where he was doing ordinary plumbing tasks. He feared negative influences from electric fields from different ma-

chines but also mercury poisoning from dental plumbs or from the metal objects he handled at work.

The medical examination revealed nothing exceptional other than a cariated tooth and positive Adson's, Tinel's and Phalen's signs. A slight increase in the leukocyte count and serum haptoglobin was noted. The mercury concentrations of his blood and urine were not exceptionally high. An electroneurologic examination showed signs of nerve-root lesions. A dermatologic examination of his hands and a cervical spine X ray revealed nothing pathological.

Provocation study

In order to verify his symptoms associated with electrical machines, a provocation study was designed. The patient was seated in a whole-body Helmholtz-coil with a homogeneous transverse electromagnetic field of either 34 or 100 μ T. The field intensity was above those found in most occupations (2) and for which physiological effects have been demonstrated (3). One or ten seconds of expo-

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sure to each of the two field intensities were randomized with sham exposures 24 times in different sessions. The blindfolded patient was wearing earmuffs and was asked after each exposure if he could note the presence of "electricity" or any symptom. Initially he made correct observations at 80–90% of the higher levels. A 50% accuracy could be expected by chance. It appeared that he could hear the humming sound from the coil in spite of the earmuffs. An additional masking noise was introduced, whereafter he answered negatively. He was also provoked by being asked to handle different metallic objects blindly; no symptoms appeared.

Discussion

No sensitivity to electromagnetic fields could be objectively detected with this patient. This finding agreed with those of later provocation studies (4). The patient was suspected of suffering from nerve-entrapment (thoracic outlet syndrome), which could explain the symptoms and findings in the arms. The dermal phenomena were suspected to be caused by palmar sweat glands. Psychophysiological models relating distress to "electric" (stressful) exposure are described (5). The patient was informed about the results. After about six months his symptoms associated with electricity had diminished and he returned to his ordinary work.

This case report illustrates some of the complexities associated with the electromagnetic field distress syndrome and its provocation. One is that sufferers make use of different cues indicative of feared exposure in lack of adequate perceptions. Few patients have had the pos-

sibility to be tested and informed about the results. In this case the provocation probably released the patient from his distress and assisted his return to work.

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