

Psychologic aspects of patients with symptoms presumed to be caused by electricity or visual display units

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Psychologic factors were studied in 10 patients with symptoms presumed to be caused by electricity (EG) and in 10 patients with symptoms presumed to be caused by visual display units (VG) and compared with a sex- and age-matched control group (CG). Psychologic differences between the EG and VG were also measured. The symptoms presumed to be caused by electricity or visual display units were registered, and the personality, psychologic functioning, and quality of life were determined by using the Karolinska Scales of Personality (KSP), an additional Personality Scale (PS), a Psychological Functioning Scale (PFS), and a Quality of Life Scale (QLS). The results showed that the commonest general symptoms in the EG/VG were skin complaints, fatigue, pain, and dizziness, and the commonest oral symptoms were gustatory disturbance, burning mouth, and temporomandibular joint dysfunction. The patients in the EG described more different types of both general and oral symptoms than those in the VG. The result showed that the VG scored significantly higher only in the KSP Somatic Anxiety and Muscular Tension scales, and the EG scored significantly lower in the KSP Socialization scale and significantly higher in the Somatic Anxiety, Muscular Tension, and Psychasthenia scales. In addition, only the EG differed significantly on the PS, PFS, and QLS. The EG differed significantly in such psychologic aspects as being more fatigued in the PS, in having more difficulty in concentrating, in taking the initiative, and in getting on with people in the PFS and experiencing inactivity and visiting other people rarely in the QLS. The conclusion was that patients with symptoms presumed to be caused by electricity and visual display units differed from each other psychologically and, therefore, should be handled clinically in different ways. The need for an interdisciplinary approach to these patients is emphasized. □ *Burning mouth; personality; psychosomatic disorder; psychotherapy; quality of life*

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Patients who claim that electromagnetic fields have an adverse effect on their health are increasingly attending medical and dental clinics. Many of the physicians and dentists are confused when these patients describe their complaints and the presumed causative factors. These patients also often have the opinion that the combination of dental amalgams and electromagnetic fields aggravates their symptoms, which puzzles the professionals even more (1). In a study, Knave et al. (2) found that the commonest symptoms in patients with presumed 'hypersensitivity' to electricity were skin complaints, followed by symptoms from the nervous system, eye complaints, and oral symptoms. The WHO (3) has stated that stress factors associated with visual display units (VDU) may create health problems. Other reports (4, 5) have also indicated that stress and mental strain are common in computerized work. Berg et al. (6) showed that employees with skin complaints suffer from occupational strain and that this was reflected in their high levels of stress-sensitive hormones and decreased levels of testosterone. Another study (7) described how psychologic factors might influence somatic reactions, and the authors proposed an interaction between chemical/physical factors and the psyche as a possible explanation of the symptoms that some patients referred

to the effect of electric or magnetic fields. Clinical experience has shown that patients with multiple systemic symptoms, presumed to be caused by electric devices, are worse off than patients with isolated skin symptoms and that these two groups of patients might represent different types of personality (8).

The aims of this study were to describe the psychologic characteristics of patients with symptoms presumed to be caused by electricity or VDU, and to determine whether there are any psychologic differences between patients with symptoms presumed to be caused by electricity and VDU, respectively.

Subjects and methods

Definitions

The patients were included in the VDU group (VG) if they related their symptoms to the exposure to VDUs, television sets, or fluorescent lighting. Patients were included in the electricity group (EG) if, besides VDU, television sets, and fluorescent lighting, they related their symptoms to the exposure to electrical sources without visible light, such as electric wires, stoves, and vacuum cleaners.

Subjects

The EG consisted of eight women with a mean age of 44 years (range, 38–54 years) and two men with a mean age of 40 years (range, 38–42 years). The VG consisted of six women with a mean age of 44 years (range, 30–56 years) and four men with a mean age of 35 years (range, 30–39 years). The EG and VG together consisted of 14 (70%) women with a mean age of 44 years (range, 30–56 years) and 6 (30%) men with a mean age of 37 years (range, 30–42 years). These 20 patients, all selected consecutively, had been referred either to the Department of Dermatology or to the Department of Occupational Medicine, Umeå University, Umeå, Sweden. A control group (CG) consisting of 20 people age- and sex-matched to the 20 patients in the EG and VG was selected from staff or patients at the Faculty of Odontology, Umeå University, Umeå, Sweden. The criterion for inclusion in the CG was that the person should not have symptoms that they presumed to be caused by electricity or VDUs.

Symptom interview

The patients in the EG and VG were asked to describe those of their symptoms which they related to the exposure to electromagnetic fields. The symptoms were divided into two groups: general and oral symptoms. In addition, information about whether the patients had replaced their amalgam fillings or whether they were in the process of doing so was recorded. The patients were also asked whether they were taking medication and, if so, what type. Finally, information about whether their symptoms had caused periods of sick leave was recorded.

Psychologic inventories

Four psychologic inventories were administered: the Karolinska Scales of Personality (KSP), the Personality Scale (PS), the Psychological Functioning Scale (PFS), and the Quality of Life Scale (QLS).

The KSP and PS were administered to describe personality in the VG and EG patients both together and separately. The KSP scales are classified into five groups (9). The first group includes the Impulsiveness, Monotony Avoidance, and Detachment scales. In the Impulsiveness scale, high scorers are described as acting in a non-planned and impulsive manner, in the Monotony Avoidance scale as avoiding routine, and in the Detachment scale as avoiding involvement with others. The Social Desirability and Socialization scales are included in the second group. High scorers in the Social Desirability scale are described as socially conforming and helpful, or as 'faking good'. High scorers in the Socialization scale describe positive childhood experiences and good school and family adjustment. The

third group is divided into two subgroups. The Somatic Anxiety and Muscular Tension scales are included in the first subgroup. The Somatic Anxiety scale describes high scorers as having autonomic disturbances and being restless and high scorers in the Muscular Tension scale as being tense, stiff, and not relaxed. The Psychic Anxiety, Psychasthenia, and Inhibition of Aggression scales are included in the second subgroup. High scorers in the Psychic Anxiety scale are described as worrying and lacking in self-confidence and sensitivity, and high scorers in the Psychasthenia scale as being fatigued easily and feeling uneasy when urged to speed up and when facing new tasks. The Inhibition of Aggression scale high scorers are sad rather than angry when scolded and have difficulties speaking up. The Suspicion and Guilt scales are included in the fourth group. The Suspicion scale high scorers are described as suspicious and distrusting people's motives, and the Guilt scale high scorers as being remorseful and ashamed about bad thoughts. The fifth and final group includes the Indirect Aggression, Verbal Aggression, and Irritability scales. The Indirect Aggression scale high scorers are described as sulking and slamming doors when angry, the Verbal Aggression scale high scorers as getting into arguments and telling people off when annoyed and the Irritability scale high scorers as being irritable and lacking patience.

The PS is derived from the Eysenck Personality Questionnaire (10) and the Cesarek Marke Personality Schedule (11). The PS concerns personality factors that are thought to be relevant but are not covered by the KSP. The PS is a 29-item inventory with scales of the Likert type graded from 1 to 15 including measures of calmness, extraversion, introversion, independence, thoughtfulness, level of emotionality, ambitiousness, and fatigue. Examples of the items include: 'Are you dependent on others?', 'Are you easily fatigued?', 'Are you pedantic?', 'Are you sensitive?', 'Are you helpful to other people?', 'Do you care about your health?', 'Are you a day-dreamer?', 'Are you stubborn?', and 'Are you a leader?'.

The PFS is an 18-item inventory also with scales of the Likert type graded from 1 to 15; it assesses the current ability to cope with different emotions, to make decisions, and to concentrate. Items included also measure the ability to have a good appetite, to experience sexual interest, and to sleep well. Examples include: 'Do you feel joy?', 'How do you get on with people?', 'Can you take the initiative easily?', 'Do you feel inferior?', 'Can you concentrate easily?', 'Do you get dizzy easily?', 'Do you feel anxiety easily?', 'Can you make decisions easily?', 'Do you get palpitations and/or indigestion easily?', 'Do you remember things?', and 'Do you think sad thoughts?'.

The QLS is a 14-item inventory with Likert-type scales graded from 1 to 15 and aims to cover various aspects of the quality of living. Items included are, for example, relations with family, friends, and colleagues

and also items referring to everyday activity, loneliness, and finances, such as: 'Are you very busy?', 'Do you have good relations with your family?', 'Do you have meaningful spare-time activities?', 'Do you have a sound personal economy?', 'Do you feel lonely?', 'Do you frequently phone other people?', 'Do you make contact with other people easily?', 'Are you satisfied with your living accommodations?', 'Do you frequently invite people home?', and 'Do you like your job?'.

The PS, PFS, and QLS are intended to cover other psychosocial aspects not covered by the KSP and were especially developed by our group for the present and other studies. The personality of the EG/VG and the CG were determined by using the KSP and PS. The PFS was used to determine psychologic functioning and the QLS to measure quality of life. The personality, psychologic functioning, and quality of life of the EG and VG, together and separately, were determined by comparing the results of the psychologic inventories in the EG and VG, together and separately, with the CG.

Statistical methods

The differences in general and oral symptoms between the EG and VG were tested by Fisher's exact test. Differences in the results of the psychologic inventories between the EG/VG together and the CG were tested by the independent two-sample *t* test on the mean scores. A one-way analysis of variance with a Bonferroni test of pairwise comparisons was performed between EG, VG, and CG to control type-I errors. The 5% level was the level of statistical significance.

Cronbach's alpha reliability coefficient (α) was measured for the PS, PFS, and QLS. The α is based on the internal consistency of the inventories. The α coefficient for the PS was 0.76, for the PFS 0.54, and for the QLS 0.70.

Statistical routines from the Epi Info and SPSS for Windows were used.

Sources of error

Patients with symptoms presumed to be caused by electricity or VDUs constitute a new and unknown group of patients, which creates new clinical challenges for physicians, dentists, and psychologists. Therefore, the present study has an explorative character, to evaluate the presence of possible psychologic causative factors. In this initial psychologic study, a small sample of patients is used to explore supposed psychologic differences. The small number of patients makes it necessary to be careful about drawing any definitive and far-reaching conclusions concerning the obtained results.

The PS, PFS, and QLS do not have any normative values, but differences between groups are still of interest. Differences in the PS, PFS, and QLS will be compared with corresponding differences in the KSP to evaluate the concurrent validity of the inventories used.

Table 1. Distribution of general symptoms in 20 patients with symptoms presumed to be caused by electricity (EG, $n = 10$) or visual display units (VG, $n = 10$)

Symptoms	EG, <i>n</i>	VG, <i>n</i>	Total, <i>n</i>	%	<i>P</i> value, EG versus VG
Various skin symptoms	8	10	18	90	NS
Fatigue	6	3	9	45	NS
Pain	7	2	9	45	<0.05
Dizziness	4	2	6	30	NS
Headache	4	2	6	30	NS
Concentration problem	5	1	6	30	NS
Various eye symptoms	4	1	5	25	NS
Memory problems	3	0	3	15	NS
Palpitations	3	0	3	15	NS
Gastrointestinal symptoms	3	0	3	15	NS
Anxiety	1	1	2	10	NS
Irritation	1	1	2	10	NS
Lack of strength	2	0	2	10	NS
Allergy	1	0	1	5	NS
Olfactory disturbance	1	0	1	5	NS
Tactile disturbance	1	0	1	5	NS

Results

Symptoms

General symptoms. In the EG and VG together (Table 1) various skin symptoms were most frequently described (90%), followed by fatigue (45%), pain (45%), dizziness (30%), headache (30%), and difficulties in concentrating (30%). As can be seen in Table 1, the symptoms and frequency of symptoms differed between the EG and VG. The patients in the EG described more different types of symptoms than the patients in the VG. Apart from skin symptoms, the EG also reported the presence of symptoms at a higher frequency, but only pain symptoms ($p < 0.05$) differed significantly (Table 1). All the patients in the VG reported skin symptoms, whereas other symptoms such as fatigue, pain, dizziness, and headache were reported by only a few patients.

Oral symptoms. Gustatory disturbances (50%) were most frequently reported in the EG/VG (Table 2), followed by burning mouth (45%), temporomandibular joint (TMJ) dysfunction (30%), dry mouth (20%), and toothache (15%). The distribution of oral symptoms (Table 2) varied between the EG and VG. Gustatory disturbances ($p < 0.05$) and burning mouth ($p < 0.05$) were significantly more frequent in the EG.

Three patients in the EG/VG had replaced their amalgam fillings, but no one was in the process of doing so. In the EG one patient was treated with iron replacement and one, who was suffering from mild hypertension, with beta blocker. In the VG one patient reported having allergic rhinitis, one bronchitis, and one asthma. The last two patients used broncodilators for their complaints. Fourteen patients, 10 in the EG and 4 in the VG, reported that they had been sick-listed

Table 2. Distribution of oral symptoms in 20 patients with symptoms presumed to be caused by electricity (EG, $n = 10$) or visual display units (VG, $n = 10$)

Symptoms	EG, n	VG, n	Total, n	%	P value, EG versus VG
Gustatory disturbance	8	2	10	50	<0.05
Burning mouth	7	2	9	45	<0.05
Temporomandibular joint dysfunction	4	2	6	30	NS
Dry mouth	3	1	4	20	NS
Toothache	3	0	3	15	NS
Oral lesion	1	1	2	10	NS
Increased secretion of saliva	1	0	1	5	NS

because of symptoms that they related to electricity or VDUs.

Psychologic aspects

Personality. The EG/VG patients scored significantly higher than the CG in the Somatic Anxiety ($p < 0.001$), Muscular Tension ($p < 0.001$), and Psychasthenia ($p < 0.001$) scales in the KSP (Table 3). The PS did not show any significant differences between the EG/VG and the CG.

The EG scored significantly lower in the Socialization scale ($p < 0.05$) in the KSP (Table 4) and significantly higher in the Somatic Anxiety ($p < 0.05$), Muscular Tension ($p < 0.05$), and Psychasthenia ($p < 0.05$)

scales. In the PS the EG was significantly more fatigued ($p < 0.05$).

With regard to the VG (Table 5), there were significant differences in the KSP scales Somatic Anxiety ($p < 0.05$) and Muscular Tension ($p < 0.05$). In the PS the VG did not differ significantly.

Psychologic functioning. In the PFS the EG/VG (Table 3) had, when compared with the CG, significantly more difficulty in concentrating ($p < 0.001$), suffered palpitation/indigestion more often ($p < 0.001$), and became dizzy more easily ($p < 0.01$). In addition, the EG/VG found it significantly harder to imagine themselves free from anxiety ($p < 0.05$). Finally, the EG/VG felt significantly more inferior ($p < 0.05$), had a worse appetite ($p < 0.05$), and had more difficulties in sleeping well ($p < 0.05$).

The EG (Table 4) reported difficulty in concentrating ($p < 0.01$), in taking the initiative ($p < 0.01$), in sleeping well ($p < 0.001$), and in feeling joy ($p < 0.01$). Furthermore, the EG reported palpitations/indigestion more often ($p < 0.05$), got dizzy more easily ($p < 0.05$), found it harder to imagine themselves free from anxiety ($p < 0.05$), and felt more inferior ($p < 0.05$). Finally, the EG found it significantly harder to be devoted ($p < 0.05$) and harder to get on with people ($p < 0.05$) and had a bad appetite ($p < 0.05$).

The VG (Table 5) showed no significant differences in the PFS.

Quality of life. The EG/VG (Table 3) patients were significantly less satisfied with their job ($p < 0.05$) than the CG. The EG (Table 4) reported that they experienced inactivity ($p < 0.01$) and visited other people

Table 3. Type of inventory/scale, description of high scorers, mean scores, standard deviations, and differences in the Karolinska Scales of Personality (KSP), Personality Scale (PS), Psychological Function Scale (PFS), and Quality of Life Scale (QLS) in patients with symptoms presumed to be caused by electricity (EG) or visual display units (VG) ($n = 20$) and a control group (CG) ($n = 20$)

Inventory/scale	Description of high scorers	EG/VG		CG		P value
		M	SD	M	SD	
KSP						
Muscular Tension	Tense and stiff, not relaxed	18.7	4.6	13.1	3.1	<0.001***
Somatic Anxiety	Autonomic disturbances, restless	18.0	4.3	12.8	2.2	<0.001***
Psychasthenia	Easily fatigued when urged to speed up and when facing new tasks	22.1	4.3	18.0	4.1	<0.01**
PFS						
	Difficulty in concentrating	7.1	4.1	3.5	2.0	<0.001***
	Hard to get palpitations/indigestion	9.1	3.7	13.1	2.6	<0.001***
	Not easily dizzy	9.7	3.7	13.1	2.4	<0.01**
	Hard to imagine oneself free from anxiety	7.0	3.9	4.3	3.2	<0.05*
	Hard to feel inferior	9.4	3.1	11.5	3.0	<0.05*
	Have a bad appetite	4.1	2.2	2.8	1.3	<0.05*
	Difficulty in sleeping well	5.0	4.1	3.2	1.7	<0.05*
QLS						
	Not at all happy with the job	5.8	3.3	3.6	3.0	<0.05*

Mean scores (M), standard deviations (SD), and P value between the patient with symptoms presumed to be caused by electricity or visual display units and the control group.

Table 4. Type of inventory/scale, description of high scorers, mean scores, standard deviations, and differences in the Karolinska Scales of Personality (KSP), Personality Scale (PS), Psychological Function Scale (PFS), and Quality of Life Scale (QLS) in patients with symptoms presumed to be caused by electricity (EG) ($n = 10$) and a control group (CG) ($n = 20$)

Inventory/scale	Description of high scorers	EG		CG		<i>P</i> value, Bonferroni
		M	SD	M	SD	
KSP						
Socialization	Positive childhood experiences, good school and family adjustment	60.6	10.5	69.8	5.3	<0.05*
Somatic Anxiety	Autonomic disturbances, restless	19.6	4.5	12.8	2.2	<0.05*
Muscular Tension	Tense and stiff, not relaxed	18.4	5.3	13.1	3.1	<0.05*
Psychasthenia	Easily fatigued when urged to speed up and when facing new tasks	23.6	2.5	18.0	4.1	<0.05*
PS						
	Almost indefatigable	6.5	2.9	9.4	2.9	<0.05*
PFS						
	Difficulty in concentrating	8.9	3.8	3.5	2.0	<0.01**
	Difficulty in taking the initiative	6.6	3.0	3.7	2.1	<0.01**
	Difficulty in sleeping well	7.7	4.5	3.2	1.7	<0.01**
	Hard to feel joy	7.9	2.8	4.6	3.0	<0.01**
	Hard to get palpitations/indigestion	7.8	4.1	13.1	2.6	<0.05*
	Not easily dizzy	8.0	3.4	13.1	2.4	<0.05*
	Hard to imagine oneself free from anxiety	8.6	4.8	4.3	3.2	<0.05*
	Hard to feel inferior	8.3	2.9	11.5	3.0	<0.05*
	Hard to be devoted	7.4	3.5	4.4	2.6	<0.05*
	Hard to get on with people	6.6	4.1	4.0	2.3	<0.05*
	Have a bad appetite	4.7	2.6	2.8	1.3	<0.05*
QLS						
	Have too little to do	7.2	2.2	3.7	2.9	<0.01**
	Rarely visit other people	10.6	2.6	8.3	3.3	<0.05*

Mean scores (M), standard deviations (SD), and *P* value between the patients with symptoms presumed to be caused by electricity and the control group.

Table 5. Type of inventory/scale, description of high scorers, mean scores, standard deviations, and differences in the Karolinska Scales of Personality (KSP), Personality Scale (PS), Psychological Function Scale (PFS), and Quality of Life Scale (QLS) in patients with symptoms presumed to be caused by visual display units (VG) ($n = 10$) and a control group (CG) ($n = 20$)

Inventory/scale	Description of high scorers	VG		CG		<i>P</i> value, Bonferroni
		M	SD	M	SD	
KSP						
Muscular Tension	Tense and stiff, not relaxed	19.0	4.0	13.1	3.1	<0.05*
Somatic Anxiety	Autonomic disturbances, restless	16.4	3.5	12.8	2.2	<0.05*

Mean scores (M), standard deviations (SD), and *P* value between the patients with symptoms presumed to be caused by visual display units and the control group.

more seldom ($p < 0.05$). The VG (Table 5) did not differ significantly.

Discussion

In the present study the distribution of sex and age in the EG/VG corresponds well with the findings in other studies (1, 2) in that middle-age women constituted the dominant group of patients. The result also showed that

when the sex and age distributions in the EG and VG were separated, women dominated even more in the EG.

The distribution of symptoms in the EG/VG are in line with other reports (1, 2), but when the EG and VG were separated, the EG patients reported various symptoms more frequently, whereas all the VG patients reported skin complaints but few other symptoms. The same pattern was noticed for oral symptoms. The commonest oral symptoms were gustatory disturbances,

burning mouth, and TMJ dysfunctions, and these findings corresponded with the distribution of oral symptoms reported by Bergdahl et al. (1), although the frequency of oral symptoms was not as high as in the present study. Although only pain, gustatory disturbances, and burning mouth differed significantly in frequency between the EG and VG, the two groups probably have different symptom profiles.

Only three (15%) patients in the EG/VG were replacing or had replaced their amalgam fillings, which diverges from the findings of Bergdahl et al. (1), who reported a figure of 61%. The different figures might be explained by the selection of subjects. In the present study the subjects were consecutively selected on referral to medical specialists, whereas the subjects in the study by Bergdahl et al. (1) were members of the Association for Those Injured by Electricity and VDU. One can assume that the members of the association had a longer history of sickness and distress of a probably chronic character. They had presumably struggled for a long time to find a cure for their complaints without a positive outcome, which had led to increased symptoms. The patients in the present study had not yet become chronically ill to the same extent. This conclusion might be confirmed by the figures with regard to sick leave. In the present study 70% of the EG/VG had been sick-listed for their complaints, whereas the corresponding figure for the members of the association (1) was 81%. When the EG and VG were separated, all the EG patients and 40% of the VG patients had been sick-listed for their complaints, which indicated that patients with symptoms presumed to be caused by electricity are more chronically ill than patients with symptoms presumed to be caused by VDU only. These findings underline the need for early care and rehabilitation of these patients before the complaints become severe and chronic. In addition, early treatment would presumably reduce social security costs.

The results of the psychologic inventories in the EG/VG might lead one to think that the EG/VG have a similar psychologic profile, whereas they in fact differ from each other. From the results of the psychologic inventories, it was obvious that patients with symptoms presumed to be caused by electricity differed psychologically from those with symptoms presumed to be caused by VDUs and should, therefore, be handled clinically in a different manner.

The EG showed several significant differences in the psychologic inventories. The low score in the KSP Socialization scale might suggest that the patients with symptoms presumed to be caused by electricity have had negative childhood experiences. The significantly higher scores in the KSP Somatic Anxiety, Muscular Tension, and Psychasthenia scales in combination with the results in the PS, PFS, and QLS indicate that these patients have a more pronounced proneness to anxiety than patients with symptoms presumed to be caused by

VDUs. In the PFS and QLS the EG patients have significantly more difficulty in taking the initiative, feeling joy, being devoted, and getting on with people but have too little to do and rarely visit other people. All these findings indicate that patients with symptoms presumed to be caused by electricity do not function psychosocially in a satisfactory manner and were therefore socially isolated both in their private and occupational lives.

The VG patients scored significantly higher only in the KSP Muscular Tension and Somatic Anxiety scales, which might indicate a proneness to somatization when exposed to stress. One can assume that somatization-prone patients would experience psychosomatic reactions and symptoms when exposed to stressful occupational situations such as strained computerized work. This interpretation is supported by the findings reported in other studies (2–5).

There was a consistency between the results of the psychologic inventories used in the present study. A low score in the KSP Socialization scale could be associated with feelings of inferiority and difficulties in taking the initiative, in being devoted, and in getting on with people in the PFS and with the feeling of having too little to do and of visiting other people rarely in the QLS. High scores in the KSP Somatic Anxiety, Muscular Tension, and Psychasthenia scales might be associated with a disposition towards fatigue in the PS and towards difficulty in concentrating and sleeping well and with the disposition towards palpitations/indigestion, the tendency to become dizzy easily, the difficulty of imagining oneself free from anxiety, and the tendency towards having a bad appetite in the PFS. Consistency of results in the KSP and the PS, PFS, and QLS suggests that the validity of the three latter inventories might be acceptable. The α values of the PS, PFS, and QLS indicated that these psychologic inventories have an acceptable reliability, but it would be desirable to have a higher α value for the PFS.

The choice of control group in the present investigation was based on various considerations. With regard to the KSP, there is a control material available (12) based on the population in Stockholm and divided into age groups with a range of 15 years. The control group in the present study was selected from the same region as the EG and VG—that is, the countryside and provincial towns. When the KSP scores of the control material (12) and the present control group were compared, there were some differences in 3 of the 15 KSP scales, namely the Somatic Anxiety, Psychic Anxiety, and Muscular Tension scales. The differences in these anxiety-related scales might reflect regional differences between the population of Stockholm and the countryside. This assumption becomes more probable when comparing the control group in the present study with the control group presented by Perris et al. (13), who selected the control group from the same region as the one of this study. The KSP scores in these two control

groups, including the scores of the anxiety-related scales, corresponded well with each other. A control group age-matched with the EG and VG with a range of a few years is preferable to one with a range of 15 years. The choice of the latter group could cause uncertainty about the result in the KSP because of the heterogeneity in the age groups.

The present results pointed out the importance of interdisciplinary care for these patients. Professionals from different disciplines such as medicine, psychiatry, and dentistry have to co-operate if these patients are to be properly investigated and successfully rehabilitated. A detailed investigating and treatment protocol could make it easier for the professionals to detect important somatic, psychologic, and environmental causative factors and, once they are identified, to design an individual rehabilitation program to achieve optimal care. It must be seen as very important to deal with these patients early to prevent the complaints from becoming chronic and, thus, more resistant to rehabilitation.

Future research should focus on the interdisciplinary approach, and the outcome of various rehabilitation strategies has to be measured.

The number of subjects in the present study is limited, and the result should therefore be interpreted with caution. The present findings, however, suggest that psychologic factors are very important in EG/VG patients, especially in the former group, and that patients with symptoms presumed to be caused by electricity and patients with symptoms presumed to be caused by VDUs differ from each other with regard to both symptoms and psychologic profile.

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