Eur Arch Psychiatry Clin Neurosci (1999) 249 : 96–102

ORIGINAL PAPER

R. J. Boerner · H. P. Kapfhammer

Psychopathological changes and cognitive impairment in encephalomyelitis disseminata

Received: 18 November 1997 / Accepted: 3 February 1999

Abstract Two hundred and twelve patients with clinically evidenced encephalomyelitis disseminata (ED), hospitalized in a neurological hospital, were observed with regard to psychopathological characteristics and cognitive changes in conformity with ICD-10 diagnostic criteria. The basis of this investigation was a standardized psychiatric interview. The age of the patients averaged 47 years whereas the duration of the disease averaged 14.3 years. 83.5% of the patients had a disease history of more than 6 years. The medium range of EDSS scores was 5.95%, the BPRS 36.7%. In 5.2% of the patients the course of ED was primarily chronic-progressive while 48% suffered from the intermittent, incomplete-reversible form: 47.6% developed secondary chronic-progressive symptoms. 18 psychopathological symptoms could be identified, the main symptom was depressive mood (49%), followed by impairment of affective sensitivity (34.9%) and affective instability/incontinence (31.1%). The most prevalent diagnoses were dementia (23.1%), organic personality disorder (18.5%), mild cognitive impairment (9%), and depressive disorder (7.6%) Only 33.5% were psychopathologically unaffected. The duration of the disease in all demented patients exceeded 6 years. Patients with an organic personality disorder showed a marked increase in the later stages of their illness in contrast to patients suffering from depressive disorder. At the beginning of ED, a highly significant ($p < 0.0001$) impairment of vision was found in all psychiatric patients. Dementia patients and organic personality patients, on the other hand, showed an advanced degree of ataxia. Actually, there was a considerably lesser incidence of pareses in the non-psychopathological group whereas ataxia was significantly more prevalent in the three cognitively impaired ED-subgroups than in the control group. These findings set the stage for constructive discussions, taking due consideration of existing research results on ED with particular reference to the implications regarding future research as well as the clinical therapy of patients.

Keywords Encephalomyelitis disseminata · Organic psychiatric disorders · Dementia · Organic personality disorder · Ataxia

Dr.Dr.med. Dipl.-Psych. R.J. Boerner (✉) · H. P. Kapfhammer
Psychiatric Hospital of the LMU Munich,
Nußbaumstraße 7, D-80336 Munich,
Tel.: *49/89/5160-3370 od. -5511, Fax: *49/89/5160-5343

Introduction

Encephalomyelitis disseminata (ED) is a frequently and chronically occurring condition in the range of neurological disorders whose prevalence within the Federal Republic of Germany is estimated at 50–70 patients to every 100 000 inhabitants (Frick, 1989; Kesselring, 1989).
The scientific discussions on type and frequency rate of psychopathological and cognitive changes inherent in this disease have a long tradition. First reports appeared already in the 19th century, e.g. by Cruveilhier (1835, 1842), Valentiner (1871), Jolly (1872), or Wernicke (1883), a survey of which is given by Boerner (1997 a).

In the course of this century, a series of case histories and systematic analyses on psychopathological symptoms associated with this disease have been published, the central issue being the psychopathological traits such as depression, emotional instability, euphoria, and psychotic exacerbation.

Also, the implications of cognitive changes are interpreted in different ways. This includes any forms of dementia, already described in 19th century medical reports as being connected with ED (Boerner, 1997 b). Kurtzke's idea (1970) that the development of dementia, as an aftereffect of ED, is an exception rather than the rule is strongly opposed by Payk, Poser & Ritter (1973 and 1980 resp.) who suggest that some 11% of ED-patients are demented. According to currently available literature on ED (e.g., Brand et al, 1993), psychopathological aspects and cognitive changes are given little consideration in respect of their significance in diagnostic and therapeutic management. In an endeavour to update the present unfortu-

nate state of scientific knowledge regarding psychopathological changes and cognitive impairment of ED, a series of questions are being raised and examined in this study.

In summary the total number of ED-patients with psychopathological symptoms (depending on differential samples and methodical standards) varies between 12% and 90%. The occurrence of depressive syndromes has been verified at 6–42%, emotional instability at 8–29%, euphoria at 2–26%, and psychotic changes at 0–32.3%.

The cause for these heterogenous results may lie chiefly in the inappropriate methodical standards – especially in the case of older studies. It is an important fact that in most, especially the older studies, the definition of the sample was insufficient, e.g., age of the patients and duration of ED were missing (clinical manifestation, severity of symptoms, and psychosocial impairment).

An important feature was that the art and accuracy of a standardized recording of psychopathological symptoms were mostly inefficient in the older studies. Psychometric scales were rarely used. Moreover, most studies lack in psychiatric diagnoses based on a standardized psychiatric interview.

So, inspite of the numerous research studies available, it remains dubious whether the principal psychopathological characteristics can be classified as symptoms, syndromes or psychiatric diagnoses.

Therefore, considering this heterogenous and partially contradictory research, it is not astonishing that the clinical and therapeutic evaluation of psychopathological and cognitive changes remains problematic.

What kind of psychopathological symptoms can be identified in an accurately defined ED-sample based on a structured psychiatric interview.

What kind of cognitive disorders including dementia can be evidenced in the sample?

What psychiatric diagnoses are derived from ICD-10?

On the basis of a clinical/psychiatric evaluation of 1420 case histories, Abb and Schaltenbrand (1956) reported an incidence of 6% for so-called depression, 11% for emotional lability, 15% for euphoria, and 1% for psychosis. Kahana et al. (1971), in their study, using ICD-9 criteria, witnessed a 25% incidence of psychopathological symptoms (emotional lability 8%, euphoria 5%, and psychotic changes 6%). In Payk's study, which was based on the psychiatric histories of 773 patients, the total proportion of psychopathological ED-symptoms was 53%, with depression 11%, emotional lability 13%, euphoria 17%, and psychosis 7%.

The incidence of demented patients was ascertained at 22% for the chronically progressive type of ED, and 10.1% for the episodic type. This incidence had a tendency of increasing the longer the disease lasted, namely from 5.6% at a duration of one year to 25.8% at a duration of more than 8 years. Poser and Ritter (1978) evaluated statistically the neurologic and psychiatric data of 157 patients with an average disease duration of 8 years, and found that the following features dominated: depression (11.6%), emotional lability (18%), and euphoria (23.6%), showing an increase of longer-term psychopathological changes with a higher degree of severity as well as a closer connection between the features ataxia and the incidence of euphoria.

By means of a standardized psychiatric interview, Sadovnick et al. (1996) could establish a high percentage of depressed patients.

Patients and methods

Two hundred and twelve patients with clinically evidenced ED were examined on the basis of the diagnostic criteria established by Poser et al. (1981). All patients were subjected to a neurological check-up including lumbar puncture and nuclear magnetic resonance (NMR).

A characteristic sample is given in Table 1.

The hospitalized patients examined were recruited from a neurological hospital which is specialized in ED and where mainly chronic ED-patients are treated. Admission to this centre was initiated by the patients themselves or their family doctor, the majority of patients (86%) being relapsers.

All patients admitted consecutively to one particular ward of this hospital within one year were subjected both to extensive neurological examination including the somatic status, EMG/NLG, evoked potentials, lumbar puncture and NMR. Major neurological symptoms at the beginning of the disease and in the actual examination were registered either retrospectively, backed by the medical record or by our own evaluation.

The psychiatric examination performed by a qualified psychiatrist included a semi-structured interview according to ICD-10 criteria.

In order to rate the psychiatric symptoms, a list of relevant items derived from the AMDP system or the ICD-10 checklist of symptoms was used.

Dementia was clinically diagnosed, using the mini-mental state-test pioneered by Folstein and Folstein (1975). Patients exhibiting values < 18 were classified as cases. So-called mild cognitive impairment was diagnosed on the basis of a semi-structured clinical interview according to ICD-10 diagnoses and was confirmed if it showed distinct deviations from the norm on a specific neuropsychological (Vienna) test battery.

In order to appraise the global severity of psychopathological symptoms, each patient's BPRS-score was registered.

The EDSS score (Kurtzke, 1970) was used for ascertaining the severity degree of neurological impairment.

To evaluate possible, statistically significant differences between the patient groups, the T-test and Fisher-test respectively

Table 1 Characteristic of the sample

	Absolute	%
Patients examined	212	
Female	153	72.2
Male	59	27.8
Age	47.7a	
Duration of disease	14.3a	
Number of patients with a disease history of < 6 years	35	16.5
Number of patients with a disease history of > 6 years	177	83.5
EDSS score	5.95	
BPRS score	36.7	
Type of ED case profile		
Primary chronic-progressive	9	4.2
Incomplete-reversible episodes	103	48
Secondary chronic-progressive	100	47.6

were conducted, the data being assessed by the SPSS programme.

Results

A total of 212 patients could be examined (see Table 1).

The number of patients with a disease history of more than 6 years averaged 83.5%. The EDSS mean score of 5.95 was below the limit of so-called “wheelchair-obligation”.

The mean BPRS score of 36.7 was high.

Nine patients (4.2%) showed a primary chronic-progressive course of disease, as against 103 patients (48%) whose disorder was of the intermittent, incomplete-reversible type. In 100 patients (47.6%) a secondary chronic-progressive course was observed.

Eighteen psychopathological characteristic symptoms were rated. Multiple ratings were possible. Individual symptoms are listed in Table 2.

The most prominent affliction was depressive mood with 49% followed by impairment of affective sensitivity (34.9%) and affective instability/incontinence (31.1%).

Symptoms of cognitive impairment also had a high rate, with grandiose ideas (0.94%), euphoria (0.94%) and hallucinations (0.42%) occurring but rarely.

Psychiatric symptoms were assessed in accordance with the operationalized criteria of ICD-10, resulting in the following psychiatric diagnoses (see Table 3).

As can be seen, the most frequent psychiatric diagnose was dementia which was established at 23.1%, organic personality disorder coming second in sequence (18.4%) and the so-called mild cognitive impairment rating at 9%. Depressive mood disorder (7.5%) was diagnosed only if a precise clinical exploration and knowledge of the disease history gave an unequivocal information that reactive factors were prominent, e.g., the inability of a patient to come to terms with his/her disorder. 3.8% of the patients tested had an alcohol or benzodiazepine abuse problem. Organic depressive disorder (2.8%) was diagnosed if no reactive components became apparent. Schizophrenic symptoms were diagnosed in 0.9% of the patients, bipolar affective disorder in 0.4%, and mental retardation in 0.4% also.

In only 71 patients (33.5%) no psychiatric diagnosis of the disease was made.

The predominant clinical/neurological symptomatology at onset of the disease and in actual exploration was graded as follows (see Table 4 and 5).

Our next question was whether the sample variables age, duration of ED, BPRS and EDSS scores of the main

Table 2 Psychopathological symptoms

	Absolute	%
Depressive mood	104	49
Impairment of affective sensitivity	74	34.9
Affective instability/incontinence	66	31.1
Impaired concentration	64	30.2
Impaired frustration tolerance	63	29.7
Impairment of recent memory	58	27.3
Lack of discrimination/ deficient judgement	51	24.1
Formal thought disorders	47	22.2
Distrustfulness	33	15.6
Cognitive impairment	31	14.6
Excitability/agitation	26	12.3
Impaired memory	26	12.3
Anxiety	23	10.8
Irascibility	20	9.4
Disturbed impulse control	11	5.2
Grandiose ideas	2	0.94
Euphoria	2	0.94
Hallucinations	1	0.42

Table 3 Psychiatric diagnoses (ICD-10)

	Absolute	%
Dementia	49	23.1
Organic personality disorder	39	18.4
Mild cognitive impairment	19	9
Depressive Disorder	16	7.5
Alcohol/benzodiazepine abuse	8	3.8
Organic depressive disorder	6	2.8
Schizophrenic disorder	2	0.9
Bipolar affective disorder	1	0.4
Mental retardation	1	0.4

Table 4 Predominant clinical/neurological symptoms at the beginning of ED

	Absolute	%
Pareses	76	30.7
Impaired sensitivity	47	19
Impaired vision	39	15.7
Ataxia	30	12.1
Oculomotor dysfunction	27	10.9
Spastic paralysis	19	7.7
Facial palsy	6	2.4
General lowering of performance	5	2
Rectovesical complaints	2	0.8
Paraplegic syndrome	2	0.8

Table 5 Predominant clinical/neurological symptoms in the actual exploration

	Absolute	%
Pareses	102	32.5
Ataxia	56	17.8
Spastic paralysis	42	13.4
Rectovesical complaints	20	6.4
Impaired sensitivity	16	5.1
General lowering of performance	5	1.6
Visual disturbances	4	1.3
Paraplegic syndrome	1	0.3
Facial palsy	0	0
Oculomotor dysfunctions	0	0

Table 6 Distribution of the variables age, duration of ED, BPRS and EDSS in the psychopathological/non-psychopathological subgroups

	Dementia		Organic personality disorder		Mild cognitive impairment		Depressive mood		Other psychiatr. disorders		No psychopathol. subgroups	
N	46		39		19		16		34		71	
	x	s	x	s	x	s	x	s	x	s	x	s
Age	49.13	12.96	43.81**	11.30	46.79	11.73	50.50	16.54	43.24**	12.29	50.45	12.75
Duration	18.13	19.5	12.15**	7.95	13.58	8.6	11.93	9.25	11.40*	8.22	17.92	11.13
BPR	43.21**	9.99	48.71**	12.43	36.63	6.91	36.56**	4.47	37.85**	10.65	5.23	5.97
EDSS	6.97**	1.19	5.30	1.65	5.84	1.64	5.41	1.89	5.28	1.97	5.97	1.65

p = comparison between the psychopathological subgroups and the non-psychopathological subgroups

** $p \leq 0.01$
* $p \leq 0.05$

Table 7 Predominant clinical/neurological symptoms at the beginning of ED, comparing psychopathological and non-psychopathological subgroups

	Dementia		Organic personality disorder		Mild cognitive impairment		Depressive mood		Other psychiat. disorders		No psychopathol. subgroups	
N	46		39		19		16		34		71	
	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no
Pareses	14	32	13	24	8	11	7	11	13	21	32	39
Ataxia	12	34	10	20	3	16	1	17	3	31	5	66
	$p > 0.005$		$p \leq 0.008$									
Impaired sensitivity	9	37	7	32	4	15	5	12	14	20	13	58
									$p \leq 0.01$			
Impaired vision	10	36	8	31	4	15	5	13	8	26	0	71
	$p \leq 0.0001$		$p \leq 0.0001$		$p \leq 0.0013$		$p \leq 0.002$		$p \leq 0.0001$			
Oculomotor dysfunction	1	38			4	15	0	0	8	38	29	42
									$p \leq 0.01$			

p = comparison between the psychopathological subgroups and the non-psychopathological subgroups

psychiatric diagnostic groups differed from those of the non-psychopathological group. We tested this to establish the main diagnoses dementia, organic personality disorder, mild cognitive impairment, depressive mood disorder, plus other psychiatric diseases, using statistical methods.

The results are shown in Table 6.

The mean age of patients suffering from organic personality disorder or other psychiatric disorders was lower and the duration of ED was longer than that of most patients in the non-psychopathological control group.

As could be expected, all psychiatric subgroups revealed significantly higher BPRS scores than the comparative non-psychopathological subgroup. Statistically, the subgroup of demented ED-patients was found to have a significantly higher EDSS impairment rating than the psychopathological control subjects.

Next, we looked at the distribution of the predominant clinical/neurological symptoms in the psychiatric subgroups and compared them with non-psychopathological controls at the beginning of ED (see Table 7).

It is noteworthy that the frequency of impaired vision was significantly higher in psychiatric patients than in the non-psychiatric group. Interestingly, ataxia occurred more often in demented patients or patients with organic personality disorder than in other groups.

Impairment of sensitivity as well as oculomotor dysfunction were more prevalent than in the non-psychopathological control group.

The same strategy of examination was used for the actual predominant clinical/neurological symptomatology. The results can be seen in Table 8.

Ataxia was highly significantly more present in patients with dementia, organic personality disorders, and mild cognitive impairment than in non-psychopathological patients. Conversely, the incidence of pareses was negligible in demented patients as well as in patients with mild cognitive impairment and depressive mood disorders, as opposed to non-psychopathological patients whose paretic symptoms occurred more frequently. No significant distinction could be evidenced between the mild cognitive impairment/depressive mood groups and the non-psychopathological group.

Table 8 Predominant neurological acute symptoms

	Dementia		Organic personality disorder		Mild cognitive impairment		Depressive mood		Other psychiat. disorders		No psychopathol. subgroups	
N	46		39		19		16		34		71	
	yes	no	yes	no	yes	no	yes	no	yes	no	yes	no
Pareses	14	32	27	12	12	7	5	13	19	15	63	8
	$p \leq 0.0001$				$p \leq 0.005$		$p \leq 0.0001$					
Ataxia	16	30	14	25	7	12	2	16	7	27	6	65
	$p \leq 0.005$		$p \leq 0.008$		$p \leq 0.005$							
Impaired sensitivity					4	15	10	8				

p = comparison between the psychopathological subgroups and the non-psychopathological subgroups

Table 9 Comparison of ED-subgroups with short-term (6 years) and medium/long-term duration (more than 6 years)

Variables	Short-term ED	Medium to long-term ED	Comparative statistics
Number of patients examined	35	177	
Age	39.33	49.18	$p \leq 0.00$
Duration of disorder	4.0	18.57	$p \leq 0.00$
EDSS	4.36	6.87	$p \leq 0.01$
BPRS	39.3	35.98	
Dementia	0	49	$p \leq 0.0001$
Organic personality disorder	13	25	$p \leq 0.0029$
Mild cognitive impairment	5	15	$p \leq 0.34$
Alcohol/-benzodiazepine abuse	2	0	$p \leq 0.05$
Depressive mood	8	10	$p \leq 0.0033$
Psychopathology unaffected	10	64	$p \leq 0.175$

Ultimately, we investigated whether any diverging results could be found between patients with short to medium-term ED-careers and patients with medium to long-term ED-careers, listing their ages, EDSS, BPRS, and the frequency rate of certain psychiatric diagnoses.

We decided on a cut-off score of 6 years in an effort to come to a conclusive comparison with other ED-studies, e.g., by Payk (1973) whose analysis of the differences between groups concentrated on a 5-year duration of ED or Poser & Ritter (1968) who based their trials on an average duration of 8 years, and Joffe et al. (1987) in whose sample an average of 4.6 years was recorded. The results of this analysis are shown in Table 9.

Thirty-five patients belonged to the short-term group, the majority belonged to the long-term subgroup.

Statistically, the EDSS score was significantly lower for the short-term group than for medium/long-term patients ($p < 0.01\%$), the BPRS scores were different to the two groups, but this was not statistically significant.

There was a highly significant difference between psychiatric diagnoses in the two groups: none of the demented patients belonged to the short-term category ($p < 0.0001\%$). Also, the majority of patients with organic personality disorders had a longer record of disease ($p < 0.0003\%$).

The ratio of patients with so-called mild cognitive disorder was statistically equal for both groups. The alcohol- and benzodiazepine-addicted were mostly short-term patients ($p < 0.005\%$). Also, depressive mood patients were more often found in the short- to medium-term subgroup ($p < 0.003\%$).

No statistically significant difference could be verified in ED-patients who had no psychopathological symptoms.

Discussion

If the average course of our ED group goes beyond 14 years, patients are referred to as a chronic subpopulation. To our knowledge, there is no study which involves patients with a duration of so many years. The only two studies based on ICD-9 criteria (Kahana, 1971; Joffe et al., 1987) concerned periods below 10 years or a mean time of 4.6 years.

The extent of psychopathological and cognitive changes evidenced was quite stupendous: only 33.5% were found to be psychopathologically unaffected, which means they were not diagnosed in accordance with psychiatric standards. However, this subpopulation showed increased BPRS values also.

Though the number of psychopathological ED-patients was high, this was to be expected as could be inferred from other studies.

Joffe et al. (1987) assessed the number of patients exhibiting certain psychopathological symptoms at 72%. It is amazing that in the study by Kahana (1971), also complying with ICD-9 criteria, the results were but 25%. Surridge (1969) reported 85%, and Payk, in his prominent German study (1973), found 53% of psychopathological cases out of 773 ED-patients.

Because of the heterogenous patient characteristics (age, length of ED) and different methods of psychopathological surveying – mostly lacking in a standardized strategy according to ICD or DSM criteria – these results cannot legitimately be compared with one another, they are simply an indication of the possible extent of psychopathology. Another critical point in discussing the different results is the degree of neurological impairment (EDSS score) and the typical course of ED in the studies. If the average EDSS score in our study is 5.95, the condition can be classified as severely impaired.

As most of the studies have not included an EDSS evaluation, a comparison is possible only in a limited way. As an example, in Surridge's study (1969) only 27.8% of patients showed a Kurtzke value of > 6.0. In a study by Joffe et al. (1987) the EDSS score was more in line with our own random tests (x = 5.9).

The relatively high percentage (47.6%) of secondary chronic-progressive disease profiles in our study gives rise to the assumption that the general prognosis for our ED-population is rather unfavourable.

A major outcome of our investigation was that dementia was the dominant psychiatric diagnosis (23.1%). This figure is all the more astounding as in all recent surveys on ED, this subject has been given little or no attention in spite of the fact that Abb and Schaltenbrand (1956) discussed a 10% incidence of mild to severe dementia. The same percentage of demented patients (10%) was verified by Payk (1973). Of particular interest is the fact that in this study the number of demented patients with a disease history of more than 5 years rose to 25.8%.

This result is commensurate with our own findings, substantiating the conception that all demented patients have a course of disease in excess of 6 years. Thus, it stands to reason that the development of dementia may not only be an important psychopathological phenomenon but probably also an indicator of a later phase of disease. Another interesting result is the high number of patients suffering from organic personality disorder (18.4%). A distinctly accelerated incidence of this type of disorder became evident in cases of prolonged duration.

This is not surprising because a core symptom of the ICD-10 diagnoses (emotional lability/incontinence) was a central item in the traditional literature, e.g., Payk (1973) found it in 13% of the patients, and in the sample of Poser and Ritter (1980) it was registered at 18%. Surridge (1989) found in his study that 40% had a "change of personality".

It is worth noting that – contrary to literature hitherto published – euphoria is rarely observed despite the fact that for a long time it has been regarded as a dominant symptom of ED. The reason for this could be that different patient populations were under examination who had different time spans of their disease. Another reason could be the possible diagnostic misinterpretation of this symptom.

Mild cognitive impairment was diagnosed in 9% of the patients. The much higher number of more serious symptoms of cognitive impairment, as authenticated in psychometric studies (Rao, 1986), is reflective of the more elaborate screening processes in these studies before a clinical diagnosis could be established.

However, bringing together the relevant ICD-10 diagnoses, our study disclosed a 4l.5 percentage of cognitively impaired patients, as was anticipated from the results of psychological tests.

Among our patients only 7.5% had the diagnosis of 'depressive disorder'. This was a low rate compared to other studies, i.e., Sadovnick et al. (1996).

One explanation was that in comparative studies, no differentiation between symptoms and the diagnosis of a depression as per ICD-10 was made. However, apart from that, the frequency ratings varied greatly, ranging from 6% to 10%. Most studies, however, estimated the number of depressive patients at 10%. On the basis of DSM-III-R, depressive disorders were shown to be 15.5% (Ron and Logsdail, 1989).

The majority of the depressive patients were recently diseased, so the confrontation with their disease and the problems of coping with and adapting to it during the first years can be a trigger for this depression.

The distribution of the other psychiatric disorders – under the aspect of ICD-10 criteria – coincided with the results of other studies.

Interestingly, type and distribution of neurological dysfunctions seem to have a relation to the individual psychiatric diagnostic groups compared with the non-psychopathological group: on the one hand especially ataxia and visual disturbances can be designated as markers particularly of cognitively impaired ED-patients, on the other hand they could be interpreted as precursors to psychiatric disorders at a later stage, whereas especially paresis is a rare symptom in those groups at the beginning of ED or in the actual examination.

These findings are in congruence with the results of other research studies, e.g., by Poser and Ritter (1980) who described considerably higher scores for ataxia in all psychopathological subgroups compared to the subgroup of psychiatrically unaffected patients.

The hypothesis of the close relationship between euphoria and cerebellar ataxia as subsymptoms of ED (he who wobbles, laughs) must be relativized since in our study ataxia frequently occurs also in other psychiatric disorders. The time-related pattern of the disorders, showing a late onset of organic personality disorders and dementia, endorses the hypothesis that such disorders possibly occur more frequently in the later stages of ED.

The methodical restraint exercised by us in compiling this study should be taken into consideration and inter-

preted accordingly: it is hardly possible to conduct a representative sample of ED since the clinical picture and the course of ED is far too heterogenous.

First, we had no control group in our study. Second, we examined long-term patients of the chronic-progressive type. It would have been desirable to get even more accurate details about psychopathological symptoms or syndromes by including more psychometric scales, e.g., scales for depression. Whether or not the validity of diagnoses would have been enhanced if some independent psychiatrists had contributed their assessment, cannot be said with certainty.

We used a structured diagnostic procedure and a rater who had extensive experience in diagnosing psychiatric disorders.

The verification of subthreshold cognitive changes through specific psychological tests would also be commendable, but it would surpass by far our research capacity.

Summing up, it may be stated that our study has proved that psychopathological and cognitive changes in ED-patients are of significant clinical relevance. Should other studies confirm the high proportion of dementia as evidenced by us, the therapeutic and sociomedical implications associated therewith would be obvious. A prospective research strategy only will answer the question whether neurological symptoms could be possible prognostic markers for specific psychopathological or cognitive changes of ED.

References

1. Abb L., Schaltenbrand G (1956) Statistische Untersuchungen zum Problem der Multiplen Sklerose. II. Mitteilung: Das Krankheitsbild der Multiplen Sklerose. Dtsch. Z. Nervenheilk. 174 : 199–218.
2. Brandt Th, Dichgans J, Diener HCh (1993) Therapie und Verlauf neurologischer Erkrankungen, Verlag W. Kohlmann, Stuttgart, Berlin, Köln, Mainz
3. Boerner RJ (1997 b) Historical aspects of psychopathological MS-Research, paper held on EAHP-congress, September 1996
4. Cruveilhier J (1835–1842) Atlas d'Anatomie pathologique. Livr.32 : 38
5. Folstein MF, Folstein SE (1975) Mini-Mental State: A practical method for grading the cognitive state of patients for the clinician. J. psychiat. Res. 12 : 189–198
6. Frick E (1980) Multiple Sklerose und andere demyelinisierende Erkrankungen des Zentralnervensystems. VC Verlagsgesellschaft, edition medizin, Weinheim, 2. Auflage
7. Joffe RT, Lippert GP, Gray TA, Sawa G, Horvath Z (1987) Mood disorder and multiple sclerosis. Arch Neurol. 44 : 376–378
8. Jolly F (1872) Über multiple Hirnsklerose. Archiv f Psych. und Nervenkr 1872; Band III
9. Kahana E, Leibowitz U, Alter M (1971) Cerebral multiple sclerosis. Neurology 21 : 1179–1185
10. Kesselring J (1989) Multiple Sklerose. Kohlhammer, Stuttgart (1989)
11. Kurtzke JF (1970) Clinical Manifestations of Mulitple Sclerosis. In: Vinken PJ & Bruyn GW (Eds.) Handbook of clinical neurology. New York: Wiley 9 : 161–178
12. Kurtzke JF (1983): Rating neurological impairment in multiple sclerosis: an expanded disability rating scale (EDSS). Neurology 13 : 1444–1452
13. Leube W (1871) Über multiple inselförmige Sclerose des Gehirns und Rückenmarks. Dtsch. Arch 8 : 1 : 1–29
14. Möller A, Wiedemann G, Rohde U, Backmund H, Sonntag A (1994) Correlates of cognitive impairment and depressive mood disorder in multiple sclerosis. Acta-Psychiatr-Scand. Feb 89(2) : 117–121
15. Payk TR (1973) Psychopathologische Besonderheiten bei Kranken mit Encephalomyelitis disseminata („multipler Sklerose"). Nervenarzt 44 : 378–380
16. Poeck K (1973) Leserbrief zu der Arbeit von Payk „Psychopathologische Besonderheiten bei Kranken mit Encephalomyelitis disseminata („Multiple Sklerose") 1973." Nervenarzt 44 : 656
17. Poser S, Ritter G(1980) Multiple Sklerose in Forschung, Klinik und Praxis. Schattauer, Stuttgart
18. Rao StM, Leo GJ, Aubin-Faubert PSt (1989) On the nature of memory disturbance in multiple sclerosis. Journal of Clinical and Experimental Neuropsychology 11,5 : 699–712
19. Rao StM (1986) Neuropsychology of Multiple Sclerosis: a critical review. Journal of Clinical and Experimental Neuropsychology 8,5 : 503–542
20. Rao StM, Huber StJ, Bornstein RA (1992) emotional changes with multiple sclerosis and Parkinson's disease. Journal of Consulting and Clinical Psychology 60: 3 : 369–378
21. Rao StM, Leo GJ, Bernardin L, Unverzagt F (1991) Cogntive dysfunction in multiple sclerosis. Neurology (41)12 : 2014–2015
22. Ron MA, Logsdail SJ (1989) Psychiatric morbidity in multiple sclerosis: a clinical and MRI study. Psychological Medicine 19 : 887–895
23. Sadovnick AD, Remick RA, Allen J, Swartz E, et al. (1996) Depression and multiple sclerosis. Neurology 46 : 628–632
24. Schiffendecker M, Krahl A, Krekel NO (1995) Psychosen bei multipler Sklerose – eine Neubewertung. Fortschr. Neurol. Psychiat. 63 : 310–319
25. Seiffer W (1905) Arch. Psychiat. Nervenkr. 40 : 252–303
26. Stenager E, Jensen K (1988) Multiple sclerosis: correlation of psychiatric admissions to onset of initial symptoms. Acta Neurol. Scand. 77 : 414–417
27. Surridge D (1969) An investigation into some psychiatric aspects of multiple sclerosis. Br. J. Psychiatry 115 : 749–764
28. Valentiner W (1856) Über die Sklerose des Gehirns und Rückenmarks. Dtsch. Klin. 8 : 147–151, 158–162, 167–169
29. Wernicke (1883) Lehrbuch der Gehirnkrankheiten, Jena