

Department of Neurology, Medical University of Lublin

HALINA BARTOSIK-PSUJEK, MAGDALENA POPOWICZ,  
AGNIESZKA ROZEGNAŁ-MADEJ, ZBIGNIEW STELMASIAK

*Depressive symptoms in patients with multiple sclerosis*

Multiple sclerosis (MS) is an inflammatory disease of the central nervous system (CNS) with a variety of intermittent and unpredictable symptoms resulting in ever increasing disability. Many MS patients end up in wheelchairs. In many countries MS is the most frequently observed neurological disability in young adults and has a major impact not only on the patients' clinical condition but also on careers, family and social life <sup>(1)</sup>. In routine clinical practice MS patient's assessment is based on physical state estimation with compliance with additional tests. Cognitive and emotional functions are usually overlooked in examination. However, according to many authors temporary lower mood symptoms are affirmed in the majority of MS patients (80–90%)<sup>(6)</sup>. At most cases these symptoms occurred directly after appearance of first disease signs and diagnosis assignation. They are a typical reaction to incurable disease menace and expected disability. The progressive stage of MS and possibility of losing independent movement is the period of significant increasing of depressive reaction. In this period depression symptoms are most clearly expressed and refer to 40–45% of MS patients<sup>(5)</sup>. The aim of the study was to determine depression symptoms appearance in MS patients and to define which factors have the largest meaning in their formation.

MATERIAL AND METHODS

The patient group included 83 people with definite MS according to Poser's criteria<sup>(8)</sup>. Depending on clinical symptoms of MS, the MS-patients were divided into two sub-groups: 54 patients had relapsing-remitting MS (RR-MS) and 29 patients had progressive MS (PROG-MS) of which 23 patients suffered from secondary progressive MS and 6 patients from primary progressive MS. All MS patients were in a stable stage of the disease – they had no relapse within the 2 months preceding the study. Control group consisted of 49 healthy people. The Hamilton Depression Rating Scale (HDRS)<sup>(2)</sup> – 17 items version was used to estimate of mood disturbances. This scale was constructed to initial evaluation of mood and grade of depressive symptoms. As a norm the value 0–7 is generally accepted – a patient has not got depressive disorders. Value 8 and more confirm depression, the stronger the higher value in scale was achieved. Simultaneously all responders were given a questionnaire prepared specially for the research needs, which helped to collect demographic and social data (age, sex, type and time of MS duration, place of residence, education). MS patients were neurologically examined with assessment of Expanded Disability Status Scale score (EDSS)<sup>(4)</sup> on the day of filling up the questionnaire. The obtained results were statistically analyzed. To evaluate statistical relationships nonparametric Mann–Whitney or Kruskal–Wallis tests were used. The correlations were assessed with the Spearman correlation test. *p* value was considered statistically significant at  $p < 0.05$ . The study was approved by a Local Ethics Committee and all subjects gave informed consent. All demographic and clinical data are summarized in Table 1.

## RESULTS

Depressive symptoms were observed in 6 (12.1%) persons from control group and in 33 MS patients (39.7%). HDRS scores were crucially different between these groups. MS patients achieved higher results than healthy ones (Mann-Whitney test,  $p=0.002$ ). Among the MS patients, HDRS scores were not connected with age, sex (women  $7.5\pm 5.0$ , men  $7.4\pm 5.1$ , Mann-Whitney test,  $p>0.05$ ) or place of residence (city  $7.0\pm 4.7$ , country  $7.8\pm 4.1$ , Mann-Whitney test,  $p>0.05$ ). Statistically significant differences were found between MS patients with different types of education (basic education  $7.2\pm 3.7$ , medium education  $9.6\pm 6.1$ , higher education  $5.1\pm 4.4$ , Kruskal-Wallis test,  $p=0.03$ ). HDRS scores in patients with RR-MS were similar to the scores of control group (Mann-Whitney test,  $p>0.05$ ); however, the patients with progressive MS had a significantly higher score of HDRS, essentially different from values of control group (Mann-Whitney test,  $p=0.0008$ ). Tab.1. HDRS results were not related with

Table 1. Baseline characteristics of subjects. Results are shown as mean $\pm$ standard deviation [results range]

	Control group N=49	MS-Group N=83	RR-MS N=54	PROG-MS N=29
Sex female/male (%)	39/10 (80/20)	54/29 (65/35)		
Age (years)	38.9 $\pm$ 10.5 [20-62]	36.2 $\pm$ 8.3 [20-59]	32.8 $\pm$ 7.1 [ 20-53]	42.4 $\pm$ 10.1 [23-59]
Place of residence city/country	38/11 (77.5/22.5)	55/28 (66/34)		
Education basic/medium/higher	1/31/17 (2/63/35)	7/48/28 8/58/34		
EDSS score		3.7 $\pm$ 1.8 [1-8]	2.7 $\pm$ 1.0 [1-4.4]	5.6 $\pm$ 1.2 [3-8]
Disease duration (years)		7.4 $\pm$ 5.3 [1-23]	6.1 $\pm$ 4.7 [1-23]	9.8 $\pm$ 5.6 [2-22]
HDRS score	4.5 $\pm$ 3.1 [0-11]	7.1 $\pm$ 5.0 [ 0-21]	6.0 $\pm$ 4.2 [0-15]	9.9 $\pm$ 5.9 [0-21]

disease duration, but a statistically significant correlation was found between EDSS and HDRS score (Spearman test,  $p=0.00008$ ) (Fig. 1). Among patients who reached results higher than 7 points, the most important role in decreasing mood was played by feeling of decreased activity and loss of interests (70%). A depressive mood had smaller impact. Somatic symptoms like sleeping and appetite disorders had the smallest meaning. The examined patients did not demonstrate being discouraged with life or having suicidal thoughts and tendencies.

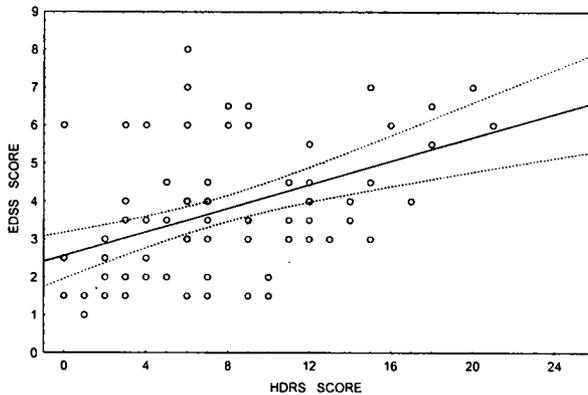


Fig. 1. Scatterplot of HDRS score plotted against the corresponding EDSS score. Value of HDRS correlated significantly with the EDSS score of MS patients ( $r = 0.42$ ,  $p = 0.00008$ ). The linear regression line and the 5% lower and 95% upper confidence curves are shown

## DISCUSSION

Our research proved that among MS patients depressive symptoms occur much more often than in the general population and are significantly related to disability level. Demographic and social factors have a clearly smaller impact in mood disorders formation. Our observations are in agreement with the observations made by other authors. Depression was found in 25–54% of MS patients (6, 7). Symptoms of depression may occur in any period of disease. They are usually observed in an advanced period of disease, but lately a report appeared about depression in MS patients without disability (3). Another interesting observation is the fact that depression in MS appears more often not only in relation to the general population but also to other chronic neurological diseases like amyotrophic lateral sclerosis (9). Therefore, depression in MS cannot be discussed only as a simple psychological reaction to disease and its consequences. Many authors took under consideration the influence of structural CNS lesions on depression occurrence. However, MS patients imaging exams (MRI, SCPECT) did not bring unambiguous conclusions. No relations between depression and the number of demyelination lesions were found. The left medial inferior prefrontal cortex T2 lesion volume and left anterior temporal CSF volume are important in the pathogenesis of depression in MS and they were demonstrated only recently (1). There is not an unambiguously proved relationship between disability and depression and literature data reveal divergence. In one research there was a significant relation between disability and depression, in another lack of any relation or only a relation between disease activity (number of relapses within one year) and depression. In our study the depression level was connected with disability measured with EDSS. Moreover the highest depression results were observed in PROG-MS group independently of disease time duration. Other clinical and demographic parameters did not have any crucial impact in depressive symptoms formation.

Depression in MS is a very important problem and concerns substantial percentage of patients. Although it is generally accepted that mood decrease in MS is a reaction to a severe disease with uncertain course the influence of organic CNS lesions should be taken into account. Depression can be effectively cured irrespectively of the cause and it can fundamentally improve the quality of life. Therefore, evaluation of depressive symptoms should be an integral element of MS patient's general examination.

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## SUMMARY

Multiple sclerosis (MS) is a chronic disease leading to permanent disability. It has influence on many aspects of a patient's life. To define the occurrence of depressive symptoms in patients with MS and to determine which agents have the largest impact in their formation, 83 patients with clinically defined MS according to Poser's criteria were examined. The control group consisted of 49 healthy people. Every person was examined using Hamilton Depression Rating Scale (HDRS) and demographic data were collected. Additionally, the MS patients underwent a clinical examination including assessment of EDSS. The HDRS scores were significantly higher in MS patients than in healthy people. There were no relations between depressive symptoms and age, sex, place of residence or disease time duration. There was a relation between depressive symptoms and type of disease and first of all between depressive symptoms and the degree of disability measured with EDSS.

## Objawy depresyjne u chorych na stwardnienie rozsiane

Stwardnienie rozsiane jest przewlekłą chorobą prowadzącą do inwalidztwa. Ma wpływ na wiele aspektów życia pacjenta. W celu określenia występowania objawów depresyjnych u chorych na SM oraz ustalenia, jakie czynniki mają największe znaczenie w ich powstawaniu, oceniono 83 pacjentów z klinicznie pewnym wg Posera stwardnieniem rozsianym. Grupę kontrolną stanowiło 49 zdrowych osób. U wszystkich przeprowadzono ocenę za pomocą Skali Depresji Hamiltona i zebrano dane demograficzne. U chorych ustalono ponadto wartość skali niesprawności (EDSS). Istotnie większe nasilenie objawów depresyjnych stwierdzono u chorych na stwardnienie rozsiane. Objawy depresyjne nie były zależne od wieku, płci, miejsca zamieszkania czy czasu trwania choroby. Zależały od postaci choroby (większe nasilenie objawów występowało u chorych z postępującą postacią choroby), a przede wszystkim były skorelowane ze stopniem niesprawności, mierzonym skalą EDSS.