

# Impact of depression on multiple sclerosis patients' life activities and treatment quality

## Depresijos įtaka sergančiųjų išsėtine skleroze veiklai bei gydymo kokybei

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### SUMMARY

**Introduction.** Although depression is the most frequent psychiatric disorder accompanying multiple sclerosis (MS) patients, only few studies have examined the impact of depression on patients' views about their MS treatment.

**Aim of the study.** To identify MS patients' views on how their MS treatment could be improved, and to evaluate differences between patients with and without depression.

**Materials and methods.** A total of 270 adult patients with MS took part in this study. Depression was assessed according to ICD-10 criteria. The impact of MS on patients' social, work, domestic activities and family life, as well as patients' views on how their MS treatment could be made more effective, were assessed by original questionnaire.

**Results.** Depression was presented in 20.7% of patients, with a similar prevalence between the sexes. Patients who indicated that MS interfered with their family life were at significantly increased risk of depression ( $P < 0.001$ ). Patients who identified the need to pay more attention to MS, and to include more medications in reimbursement lists, as factors that would improve the management of MS, were more likely to be diagnosed with depression. **Conclusions:** The negative impact of MS on family life is an important factor contributing to the risk of depression. Further studies are needed to document patients' perceptions of the disease, its management, and correlations to the risk of depression.

**Key words:** depression; multiple sclerosis; treatment quality .

### SANTRAUKA

**Įvadas.** Depresija yra vienas dažniausių psichikos sutrikimų, kurie pasireiškia išsėtine skleroze (IS) sergantiems pacientams, deja, tik nedaugelis tyrimų analizuoja, kokia yra depresijos įtaka pacientams, patiems vertinantiems IS gydymą.

**Tyrimo tikslas.** Įvertinti pačių IS pacientų požiūrį, kaip būtų galima pagerinti IS gydymą bei įvertinti skirtumus tarp pacientų, kuriems diagnozuotas depresijos epizodas ir kuriems šis sutrikimas nedidino IS gydymo.

**Tyrimo medžiaga ir metodai.** Tyrime dalyvavo 270 sergančiųjų IS. Depresijos epizodo pasireiškimas buvo vertinamas remiantis TLK-10 kriterijais. Naudojant originalų klausimyną buvo vertinama IS įtaka paciento socialinei, darbinei, buitinei veiklai ir šeimyniniam gyvenimui bei kokiomis priemonėmis būtų galima pagerinti IS gydymo kokybę.

**Rezultatai.** Depresijos epizodas diagnozuotas 20,7 proc. tiriamųjų vienodai pasireiškė abiem lytims. Depresijos rizika buvo reikšmingai didesnė tiems pacientams, kurie nurodė, kad IS neigiamai veikia jų šeimyninį gyvenimą ( $P < 0,001$ ). Pacientams, kurie kaip veiksnius IS gydymui pagerinti nurodė didesnio dėmesio IS poreikį bei pageidavo įtraukti daugiau vaistų į kompensuojamųjų vaistų sąrašą, depresijos epizodas buvo diagnozuojamas dažniau.

**Išvados.** Neigiamas IS poveikis pacientų šeimyniniam gyvenimui yra reikšmingas veiksnys, galintis turėti įtakos depresijos pasireiškimui. Tačiau reikia daugiau tyrimų, norint išsamiau įvertinti paciento ligos suvokimą, jos gydymo galimybes bei sąsajas su depresijos pasireiškimo rizika.

**Raktažodžiai:** depresija, išsėtinė skleroze, gydymo kokybė.

### INTRODUCTION

Multiple sclerosis (MS) is a neurodegenerative disorder, which most commonly develops between the ages of 20 and 40 years, and is associated with substantial disability [1, 2] and impaired quality of life [3]. The high burden of morbidity associated with MS imposes substantial demands on healthcare resources. Data from 28 European Union (EU) countries suggest that in 2005 the total costs associated with MS were €12.5 billion; direct treatment costs accounted for €6 billion, while informal care and indirect costs associated with high morbidity accounted for a further €3.2 billion each [4].

Depression is the most common psychiatric disorder associated with MS, with an annual incidence of 20–40% and a lifetime incidence of 40–60% [5, 6]. Furthermore, although life expectancy in MS patients is generally comparable with

that in individuals without MS, more than half of all deaths are related to MS complications, and 15% are due to suicide [7]. Timely diagnosis and treatment aimed at limiting disability and managing MS complications such as urinary and digestive disorders, sexual dysfunction and pneumonia are important for improving quality of life, and relieving or preventing depression, in MS patients.

The impact of MS and concomitant depression has been widely studied using clinical scales such as the Expanded Disability Status Scale (EDSS) [8], standardized quality of life instruments such as the Short-Form 36 (SF-36) questionnaire [9], and specific depression rating scales [10–13]. However, information is still lacking on how depression affects patients' own views of their illness, and the measures needed to improve the management of MS in depressed patients. Hence, this study

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was undertaken to assess patients' views of the impact of MS on their daily lives and current needs in MS management, and the relationship between these perceptions and the presence or absence of depression.

### MATERIALS AND METHODS

The study involved continuous series of 270 adult patients (age  $\geq 18$  years) with a confirmed diagnosis of MS, who were treated in the Department of Neurology (n=135) or the MS Centre (n=135) at Kaunas University of Medicine Hospital, Lithuania, between June 2006 and June 2009. Ethical approval for the study was obtained from the Kaunas Regional Biomedical Research Ethics Committee, and all patients provided informed consent, which they had to confirm.

All patients completed a questionnaire which was developed from those used in previous studies by other authors [14, 15, 16]. This questionnaire covered patients' sociodemographic characteristics and the impact of MS on social, domestic and work activities and family life. In addition, patients were asked to indicate which of 12 proposals for the improvement of MS management they considered to be most important. These proposals were: paying more attention to MS (clinicians should devote more time to MS management); more government assistance (more funding); establishment of more specialist MS centres; more public information about MS; assistance with MS-related financial difficulties; improving the early diagnosis of MS; simplifying diagnostic and treatment algorithms; including MS medications in reimbursement lists; promotion and improvement of social, physical and psychological rehabilitation; and improved MS nursing.

Depression was diagnosed according to the 10th International Classification of Diseases (ICD-10) criteria [17].

### STATISTICAL ANALYSIS

The normality of the data was assessed by means of the Komogorov-Smirnov test. For normally distributed variables, differences between patients with and without depression were analysed by Student's t-test and analysis of variance (ANOVA); Mann-Whitney U-tests and Kruskal-Wallis tests were used for non-normally distributed data. Distribution differences between depressed and non-depressed patients were analysed by  $\chi^2$ -tests, with calculation of 95% confidence intervals (CIs). Multifactor logistic regression analysis was performed to weight the impact of depression on the independent factors.

All analyses were performed using SPSS (version 13.0) for Windows (license number 9582494). P values below 0.05 were considered significant.

### RESULTS

Of the 270 patients included in this study, 187 (69.3%) were female. The mean ( $\pm$ SD) age of the patients was  $42.4 \pm 11.5$  years; women:  $42.7 \pm 11.8$  years;  $t = 0.514$ ,  $P > 0.05$ ). The mean duration of MS was  $6.39 \pm 5.4$  years. Depression was present in 56 patients (20.7%), with a similar prevalence in men and women (21.7% versus 20.3%, respectively;  $\chi^2 = 0.065$ ,  $P > 0.05$ ). Overall, the prevalence of mild, moderate and severe depression was 2.6%, 7.0% and 11.1%, respectively; there were no significant relationships between the severity of depression and mean age, mean age at diagnosis, or median duration of MS (Table 1-3).

**Table 1. Mean age characteristics of material considering prevalence of depression**

	Total n (%)	Mean age n (%)	95% CI	Females n (%)	Mean age n (%)	95% CI	Males n (%)	Mean age n (%)	95% CI	t
Total	270 (100)	42.42 (11.71)	41.02-43.82	187 (69.3)	42.66 (11.83)	40.96-44.37	83 (30.7)	41.87 (11.5)*	39.36-44.38	0.514
Depression free	214 (100)	42.8 (11.9)	41.2-44.4	149 (69.6)	42.79 (12)	40.84-44.73	65 (30.4)	42.83 (11.76)*	39.92-45.74	0.026
Total depression	56 (100)	40.96 (10.96)	38.03-43.9	38 (67.9)	42.18 (11.29)	38.48-45.89	18 (32.1)	38.39 (10.05)*	33.39-43.39	1.216
Mild depression	7 (100)	44.43 (14.55)	30.97-57.88	5 (71.4)	47.8 (15.07)	29.08-66.52	2 (28.6)	36 (12.73)*	-	0.964
Moderate depression	19 (100)	41.53 (9.84)	36.78-46.27	15 (79)	41.07 (10.97)	34.99-47.14	4 (21)	43.25 (3.78)*	37.24-49.26	0.385
Severe depression	30 (100)	39.8 (10.92)	35.72-43.88	18 (60)	41.59 (10.67)	36.25-46.86	12 (40)	37.17 (11.23)*	30.03-44.3	1.081

**Table 2. Characteristics of material mean age at MS onset considering prevalence of depression**

	Total n (%)	Age at MS onset n (%)	95% CI	Females n (%)	Age at MS onset n (%)	95% CI	Males n (%)	Age at MS onset n (%)	95% CI	t
Total	270 (100)	36.03 (11.15)	34.69-37.36	187 (69.3)	35.96 (11.4)	34.32-37.61	83 (30.7)	36.17 (10.62)*	33.85-38.49	0.14
Depression free	214 (100)	36.54 (11.22)	35.03-38.05	149 (69.6)	36.27 (11.64)	34.38-38.15	65 (30.4)	37.17 (10.23)*	34.63-39.7	0.539
Total depression	56 (100)	34.05 (10.75)	31.18-36.93	38 (67.9)	34.76 (10.45)	31.33-38.2	18 (32.1)	32.56 (11.51)*	26.83-38.28	0.715
Mild depression	7 (100)	37.57 (13.18)	25.39-49.76	5 (71.4)	40.6 (13.99)	23.23-57.97	2 (28.6)	30 (9.9)*	-	0.954
Moderate depression	19 (100)	33.68 (7.98)	29.84-37.53	15 (79)	32.4 (8.53)	27.68-37.12	4 (21)	38.5 (1.92)*	35.45-41.55	1.39
Severe depression	30 (100)	33.47 (11.84)	29.05-37.89	18 (60)	35.11 (10.8)	29.74-40.48	12 (40)	31 (13.34)*	22.52-39.48	0.93

\*p>0.05 comparing females versus males

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Table 3. Characteristics of material mean MS duration considering prevalence of depression

	Total n (%)	MS duration n (%)	95% CI	Females n (%)	MS duration n (%)	95% CI	Males n (%)	MS duration n (%)	95% CI	<i>t</i>
Total	270 (100)	6.39 (5.4)	5.75-7.04	187 (69.3)	6.7 (5.38)	5.92-7.48	83 (30.7)	5.7 (5.41)*	4.52-6.88	1.41
Depression free	214 (100)	6.26 (5.58)	5.51-7.01	149 (69.6)	6.52 (5.49)	5.63-7.41	65 (30.4)	5.66 (5.77)*	4.23-7.09	1.032
Total depression	56 (100)	6.91 (4.64)	5.67-8.15	38 (67.9)	7.42 (4.91)	5.81-9.03	18 (32.1)	5.83 (3.93)*	3.88-7.79	1.2
Mild depression	7 (100)	6.86 (3.76)	3.38-10.34	5 (71.4)	7.2 (4.32)	1.83-12.57	2 (28.6)	6 (2.83)*	-	0.352
Moderate depression	19 (100)	7.84 (5.04)	5.41-10.27	15 (79)	8.67 (4.9)	5.95-11.4	4 (21)	4.75 (4.86)*	2.98-12.48	1.421
Severe depression	30 (100)	6.33 (4.61)	4.61-8.06	18 (60)	6.44 (5.08)	3.92-8.97	12 (40)	6.17 (4.02)*	3.61-8.72	0.159

\* $p > 0.05$  comparing females versus males

The impact of MS on daily activities in depressed and non-depressed patients is summarized in Table 4. Overall, 67.4% of patients reported that MS affected their social life, 75.6% reported that MS affected work activities, 68.1% reported effects on domestic activities and 50.7% reported effects on family life. In each case, depressed patients were significantly more likely than non-depressed patients to report impairment due to MS.

Multiple logistic regression analysis was used to identify independent factors associated with depression. This analysis showed that patients who reported a negative impact of MS on family life were significantly likely to have experienced a depressive episode than those who did not (odds ratio [OR] 7.2, 95% CI 3.36–15.4). By contrast, impairment by MS of social, domestic or work activities was not significantly associated with depression (Attachment 1).

Table 4. Proportion of patients reporting impairment by MS of social, work and domestic activities

	Overall (n=270)		Patients with depression (n=56)		Patients without depression (n=214)		$\chi^2$	<i>P</i> *
	n	%	n	%	n	%		
Impairment of social activities	182	67.4%	47	83.9%	135	63.1%	8.778	<0.01
Impairment of work activities	204	75.6%	51	91.1%	153	71.5%	9.21	<0.01
Impairment of domestic activities	184	68.1%	49	87.5%	135	63.1%	12.19	<0.001
Impairment of family life	137	50.7%	47	83.9%	90	42.1%	31.14	<0.001

\*Depressed versus non-depressed patients

Table 5. Proportion of patients with and without depression identifying specific proposals as important for improving the management of MS

	Overall (n=270)		Patients with depression (n=56)		Patients without depression (n=214)		$\chi^2$	<i>P</i>
	n	%	n	%	n	%		
Paying more attention to MS	151	55.9%	40	71.4%	111	51.9%	6.889	<0.01
More government assistance	135	50.0%	35	62.5%	100	46.7%	4.416	<0.05
More MS specialist centres	114	42.2%	19	33.9%	95	44.4%	1.992	>0.05
More information on MS	152	56.1%	26	46.4%	126	58.9%	2.1796	>0.05
Assistance with MS-related economic difficulties	192	71.1%	42	75.0%	150	70.1%	0.520	>0.05
Better early diagnosis of MS	140	51.9%	31	55.4%	109	50.9%	0.348	>0.05
Simpler diagnostic and treatment algorithms	183	67.8%	37	66.1%	146	68.2%	0.094	>0.05
Inclusion of MS medications on reimbursement lists	128	47.4%	36	64.3%	92	43.0%	8.073	<0.01
Better social rehabilitation	112	41.5%	30	53.6%	82	38.3%	4.254	<0.05
Better physical rehabilitation	164	60.7%	39	69.6%	125	58.4%	2.348	>0.05
Better psychological rehabilitation	203	75.2%	45	80.4%	158	73.8%	1.013	>0.05
Better MS nursing	177	65.6%	40	71.4%	137	64.0%	1.079	>0.05

*Attachment 1. Multiple logistic regression analysis of independent factors associated with depression*

Independent factor		Exp.B	95% CI for Exp.B	
			Lower	Upper
Negative impact of MS on patients family life	Yes	7,195	3,355	15,432
	No	1,00		
Constant		0,073		

As described above, patients were presented with 12 proposals for improving the management of MS. Responses to these proposals are shown in Table 5. The interventions most commonly identified as important were improving psychological rehabilitation, which was identified by 75.2% of patients, assistance with MS-related economic problems (71.1%), simplifying MS treatment (67.8%) and improving MS nursing (65.6%). Patients with depression were significantly more likely than those without to identify paying more attention to MS, more government assistance, inclusion of MS medications in reimbursement lists, and better social rehabilitation, as important; there were no significant differences between depressed and non-depressed patients for any of the other proposals. Multiple logistic regression showed that patients with depression were more than twice as likely as non-depressed patients to identify paying more attention to MS (OR 2.1, 95% CI 1.1–4.3) and including MS medications on reimbursement lists (OR 2.1, 95% CI 1.1–3.9) as important.

**DISCUSSION**

This study in MS patients in Lithuania showed that approximately 21% were suffering from depression, diagnosed according to the ICD-10 criteria. This finding is comparable with those of studies in other countries, where prevalences of approximately 36–60% have been reported [18-21]. The prevalence of depression was similar in men and women; this finding is also consistent with previous reports [22, 23] although some studies have reported a higher prevalence in women [20].

In this study, MS had marked impacts on social, domestic and occupational functioning, and on family life. These findings are consistent with those of previous studies showing significant impairment of social, domestic and work activities in MS patients [24, 25, 26]. Similarly, MS significantly affects the probability of remaining in the same relationship compared with the background population. Five years after onset, the cumulative probability of remaining in the same relationship was 86% in patients vs. 89% in controls. The probabilities continued to deviate, and at 24 years, the probability was 33% in patients vs. 53% in the control persons ( $p < 0.001$ ) [27]. The present study shows that this adverse effect of MS on quality of life may be exacerbated in patients with depression: depressed patients were significantly more likely to report that MS interfered with social, domestic and work activities and family life than non-depressed patients. Indeed, patients who indicated that MS interfered with their family life were seven times more likely to be diagnosed with depression than those who reported no such interference. Clearly, the combination of depression and the disability associated with MS itself can severely impair quality of life and normal functioning. Physicians have an

important role to play in diagnosing depression in MS patients, and encouraging the patients to talk about their feelings and seek appropriate treatment; such interventions may lead to a significant improvement in quality of life [28].

In the present study, patients were asked to identify which of 12 potential interventions they considered most important in improving the management of MS. Overall, the highest priorities were considered to be better psychological rehabilitation, assistance with MS-related economic problems, simpler MS treatment and better MS nursing. However, patients with depression were more than twice as likely as non-depressed patients to identify paying more attention to MS and including MS medications on reimbursement lists as important. Such findings might suggest a considerable level of dissatisfaction with current MS management, particularly with respect to the management of psychosocial problems associated with MS. This is supported by a study in Sweden, in which 166 MS patients were questioned about their satisfaction with their MS treatment. In general, patients were satisfied with their management, except for a lack of access to rehabilitation and psychosocial counselling services [29]. In a further study [30] patients were offered 75 proposals for improvements in MS services, in an attempt to identify the 10 most important areas for intervention. Consistent with the present study, the most important areas identified were those related to fulfilment of psychosocial needs, such as relationships with healthcare providers, family and friends. Further studies of patients' views of their disease and its management, and the impact of impaired quality of life on these perceptions, are needed in order to improve the management of MS.

In conclusion, this study has shown that depressed MS patients are significantly more likely than non-depressed patients to report that MS impairs their family life. In addition, depressed patients identified the amount of attention paid to MS, and the inclusion of more medications in reimbursement lists, as important in improving the management of MS.

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**Declaration of interest**

Authors of this scientific article declare no interest with any pharmaceutical, private or public enterprises.

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