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ORIGINAL ARTICLE

The Association of Pain with Walking Speed and Functional Abilities in Patients Suffering from progressive forms of multiple sclerosis

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Summary

Introduction/Aim: In progressive forms of multiple sclerosis (MS), the frequency of pain increases as the disease progresses affecting patients' functional abilities and making the disease much more complex. We conducted a cross-sectional study to examine the association of pain with walking speed and functional abilities in patients who suffer from progressive forms of multiple sclerosis.

Material and methods: The cross-sectional study was conducted at the Clinic for rehabilitation "Dr Miroslav Zotović" in the period from January 2020 to May 2023. The research included 55 patients with primary progressive MS and secondary progressive MS consecutively admitted to this Clinic for rehabilitation. Demographic and socio-epidemiological data and disease-related data were collected from all the patients. Pain intensity was assessed using *Numeric Rating Scale* (NRS). Since all patients experienced spasticity, pain was also assessed using the Pain/Discomfort (PD) subscale of the Multiple Sclerosis Spasticity Scale 88 (MSSS-88). The subjective perception of gait impairment was assessed using a subscale of the same questionnaire, MSSS 88, related to walking, namely the Walk (WL). Walking speed was measured by *The Timed 25 Foot Walk* (T25FW). The functional assessment and all questionnaires were completed in the morning hours over a 24-hour period from the day patients were admitted to rehabilitation.

Results: There is a significant strong correlation between WL and P/D (rho=0. 770; p<0.001) and between WL and NRS (rho=0. 825 p<0.001). There is a statistically significant moderate negative correlation between T25FW and NRS pain (p<0.001). There is no statistically significant correlation between T25FW and pain intensity measured by PD (p=0.033). There is a statistically significant correlation between EDSS and pain intensity (NRS p=0.002; PD p=0.006) either.

Conclusion: The results of this research indicated a significant negative impact of pain on walking speed and functional disability.

Key words: pain, walking speed, functional disability, progressive forms of multiple sclerosis

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INTRODUCTION

Multiple sclerosis (MS) is a chronic immune-mediated and neurodegenerative disease of the central nervous system (CNS) whose etiology remains unknown (1). Since it affects the most productive population and leads to long-term physical disability over time, MS is not only a health problem, but a social and economic problem as well (2). Recognizing the dominant cause of functional impairment in MS patients is of great importance for tailoring an individualized, effective treatment plan and improving the quality of life.

Throughout the course of MS, pain is a common, varying symptom which has significant effects on an individual's functional capacity and quality of life (3,4). It is strong predictor of activity limitations and participation restrictions in MS patients (5,6). One third of people with MS describes pain as one of their worst symptoms (7). Pain can appear as an acute syndrome, but chronic pain occurs in 50–75% of MS patients in different stages of disease progression (8). The most frequent types of pain are spasticity pain and headache (prevalence rates of 43%–60%), central neuropathic pain (CNP, 5%–28%), and back pain (10%–20%) (9). According to literature data, pain is treated in only 38% of patients, and treatment satisfaction has been verified in 61% of patients (10). Poor analgesic outcomes indicates that pain control in these patients is still insufficient (10) and may result from pain heterogeneity in MS (11,12). Pain relief is not important only because of the frequency of pain and its impact on functional disability during the disease, but also because of the consequences it has on various daily aspects of patient's life. Recognized risk factors for pain in MS are as follows: older age, longer disease duration, higher EDSS score, accompanying depression or mental disorders, unstable course of the disease, lower level of education, progressive disease phenotypes (5,13). In progressive forms of MS, the frequency of pain and the degree of spasticity increase with disease progression, which affects the gait and has negative consequences on patients' functional status and the quality of life (14). Rehabilitation requirements are derived from severe functional impairment, where the treatment of spasticity, pain and muscle weakness is of greatest importance (2).

Functionality is a complex process that includes an interaction between a patient's mental and physical abilities and is not linearly correlated with the impairment. Walking ability is the basic characteristic of functional independence, so one of the greatest challenges in rehabilitation of patients with MS is to preserve it. The results of some studies showed that 70% of patients with walking difficulties perceived this aspect of the disease as the main functional problem in performing daily activities (15). A large number of patients experience walking difficulties in early stages of the disease (2). In the first month upon the diagnosis, 45% of patients experience impaired mobility, while after a decade of living with the disease 93% of patients have walking difficulties (16). Walking difficulties can be related to reduced walking capacity alone or combined with MS symptoms, such as reduced muscle strength, spasticity, poor balance, fatigue, pain, and depression (17,18).

Although there is considerable medical and scientific interest, the association between pain intensity and walking speed and functional disability has not been fully established in MS patients yet. We conducted a cross-sectional study with the aim of examining the association of pain with walking speed and functional disability in MS patients.

MATERIAL AND METHODS

The research included 55 patients diagnosed with primary progressive multiple sclerosis (PPMS) and secondary progressive multiple sclerosis (SPMS) consecutively admitted for rehabilitation at the Clinic for rehabilitation "Dr Miroslav Zotović". The inclusion criteria were as follows: (a) Patients 18-65 years of age with a confirmed form of SPMS or PPMS, (b) Presence of back pain and/or painful spasms in lower extremities for more than six months (in order to exclude the presence of pain due to current exacerbations of MS), (c) Degree of functional disability (*Expanded Disability Status Scale* - EDSS) < 6.5 and (d) PainDETECT questionare score <19 (19). The exclusion criteria were as follows: clinical worsening in the past 30 days, other medical conditions that interfered with walking, headaches, serious associated diseases (malignancy, cardiovascular disease).

The research was conducted in the period from January 2020 to May 2023.

The sample size was based on the assessment of the correlation between variables in patients with multiple sclerosis. According to the literature, a correlation between the variables EDSS and Pain/Discomfort (PD) was found in patients with multiple sclerosis (correlation coefficient 0.38)(20). The minimum number of participants needed to estimate the correlation of these variables of interest with a statistical power of 80% and a significance level of 0.05 is 52.

Each patient was introduced to all the details of the protocol and their written consent was required. Demographic and socio-epidemiological data (age, gender, marital status and level of education) as well as the disease-related data (disease duration, disease form, EDSS, presence of spasticity for six months, representation of pain, analgesic and spasmolytic therapy, satisfaction with pain relief) were collected. The *Numerical Rating Scale* (NRS) was used for the assessment of pain intensity. Since all patients experienced spasticity, pain was also assessed using the PD subscale of the Multiple Sclerosis Spasticity Scale 88 (MSSS-88). The subjective percep-

tion of gait impairment was assessed using a subscale of the same questionnaire, MSSS 88, related to walking, namely the Walk (WL). Both subscales were used particularly since authors suggest they could be used as stand-alone subscales (20,21). Quantitative assessment of mobility and leg function performance was measured according to walking speed using the clinical instrument *The Timed 25 Foot Walk* (T25FW). T25FW was used by a physiotherapist while other measurements were done by doctors. The functional assessment and all questionnaires were completed in the morning hours over a 24-hour period from the day patients were admitted to rehabilitation.

All participants signed an informed consent for taking part in the research, which was approved by the Clinic's Ethics Committee (No.32-2226/2).

Pain intensity was assessed using the following scales:

Numeric Rating Scale (NRS) represents a subjective assessment of pain intensity in patients. The 11-point numeric scale ranges from 0 to 10, where 0 indicates the absence of pain and 10 indicates the most intense pain (unbearable pain). Mild pain is graded as 1, 2 or 3, moderate pain is graded as 4, 5 or 6, while severe pain is graded as 7, 8 or 9 and the most intense pain is graded as 10. Patients were given verbal instructions to choose a number on the scale that corresponded to pain intensity they experienced in the past 24h or, more precisely, to choose three ratings on the scale that corresponded to the current, best, and worst pain intensity experienced in the past 24h. The mean value of these three values represented the final grade (3,22).

Pain/Discomfort (PD) – a subscale of the *Multiple Sclerosis Spasticity Scale88* (MSSS-88) questionnaire. The subscale contains 9 questions. Answer categories are graded according to Likert in the following way: 1. does not bother me at all, 2. it bothers me a little, 3. it bothers me moderately, 4. it bothers me a lot. We calculated the score of each subscale separately and the total score by simply adding up the responses. The subscale values can be scored as an independent measurement instrument, and possible values are 9 to 36. This scale correlated significantly with MSWS-12 and also corelated with EDSS (20,23).

Gait was assessed by the following test and scale:

T25FW (*theTimed 25 Foot Walk*)–a clinical instrument for quantitative assessment of mobility and leg function performance based on a timed 25-foot walk (7.62m). Subjects are instructed to walk a marked 7.62m-long path quickly and safely. The time is calculated from the moment instructions are given to the end of the marked 7.62 m-long path. The second T25FW performance is done immediately after the first, having the patient walk the same distance. Patients are allowed to use aids during the test. T25FW score is the average of two performance tests (24,25).

Walk (WL - Perception of gait impairment)–a subscale of the *Multiple Sclerosis Spasticity Scale88* (MSSS-88) questionnaire. The subscale contained 10 questions. The response categories were graded according to Likert in the following way: 1. it does not bother me at all, 2. it bothers me a little, 3. it bothers me moderately, 4. it bothers me a lot. We calculated the score of each scale separately, as well as the overall score by simply adding up the responses. Subscale values can be scored as an independent measurement instrument, possible values being 10-40. This scale correlated significantly with EDSS, MAS (Modified Ashworth Scale) and MSWS-12 (20,23).

The degree of functional impairment was assessed using the following scale:

Expanded Disability Status Scale (EDSS) is a scale used for assessing physical impairment in MS patients. According to this scale and the neurological examination, the impairment is presented using a numeric value. The degree of impairment in 8 functional systems (visual, brainstem, pyramidal tract, sensory, cerebellar, sphincter function, cerebral or mental function) and the patient's ability to walk were assessed. This score can range from 0 (normal neurological finding despite the symptoms) to 10 (death due to MS). EDSS 1.0 to 4.5 corresponds to patients who can walk independently. EDSS 5.0 to 9.5 includes the presence of a severe mobility disorder. The scale has good validity and reliability, whereas some studies found its sensitivity inadequate. Another disadvantage is a significant impact of walk on the overall score (26).

STATISTICAL ANALYSIS

Depending on the type of variables and normality of distribution, the description of the data is shown as n (%), arithmetic mean ±standard deviation, or median (range, min-max). The Pearson correlation coefficient and Spearman's rank correlation coefficient are used to analyze correlations. Statistical hypotheses were tested at a statistical significance level (alpha level) of 0.05. All data were processed in IBM SPSS Statistics 22 (SPSS Inc., Chicago, IL, USA) software package.

RESULTS

The study included 55 patients with progressive forms of MS. The basic demographic characteristics of the patients are shown in **Table 1**.

The majority of patients were female (80%), had secondary education (72.7%), were married (65.5%), and retired (58.2%). The average age of the respondents was 46.3±9,4 years. **(Table 1)**

Table 1. The basic demographic characteristics of the patients

Variable	Respondents (n=55)
Gender	
• male	11 (20.0%)
• female	44 (80.0%)
Age	45.96±9.4 (29-67)
Level of education	
• high school	40 (72.7%)
• university	15 (27.3%)
Marital status	
• married	36 (65.5%),
• divorced	7 (12.7%)
• single	10 (18.2%)
• widowed	2 (3.6%)
Employment	
• employed	16 (29.1%)
• retired	32 (58.2%)
• unemployed	7 (12.7%)

[a] arithmetic mean ±standard deviation

Table 2. The basic clinical characteristics of patients

Variable	Respondents (n=55)
Disease form	
- primary progressive	32 (58.2%)
- secondary progressive	23 (41.8%)
Disease duration[a] (years)	11,56±6,271 (2-24)
Spasticity	
Yes	55 (100%)
No	0
Representation of pain	
Back pain	25 (45.45%)
Painful spasms in lower limb	17 (30.9%)
Back pain and painful spasms in lower limb	13 (23.6%)
Analgesics	25 (45%)
NSAIL	15 (60%)
Anticonvulsants	9 (36%)
Other (homeopathic remedies)	1 (4%)
Spasmolytics	20 (36.4%)
Satisfaction with pain relief	26 (47.27%)
NRS pain[a]	5 (3-8)
P/D[b]	17.6±5.3 (9-28)
T25FW[b]	0.76±0.25 (0.32-1.33)
WL[b]	24.2±7.5 (11-40)
EDSS score[a]	5(3-6,5)

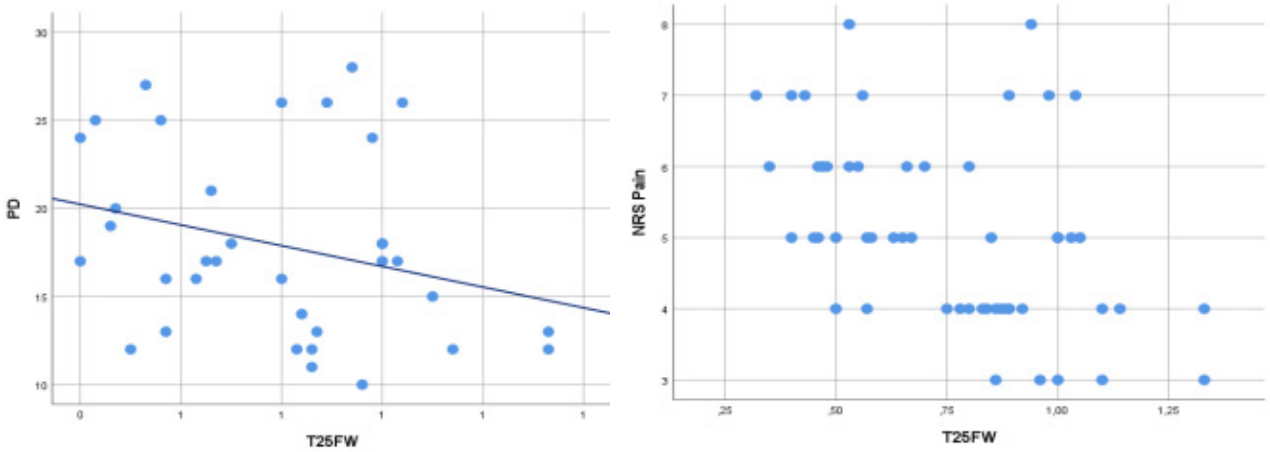
[a]median±interquartile range (range); [b]arithmetic median±standard deviation (range) EDSS – Expanded Disability Status Scale; T25FW – The Timed 25 Foot Walk; NRS – Numeric Rating Scale for pain assessment; P/D - pain and discomfort; WL – Walk

According to clinical characteristics, the majority of patients had the primary progressive (PP) form of MS (58.2%) with median disease duration of 11 years (range, 2-22). Median NRS pain was 5 (range, 3-8), while the average PD value in all respondents was 17.6±5.3 (the lowest value was 9, and the highest value was 28). The total number of patients who used analgesics was 25 (45%), of which 25 (60%) used NSAIL, 9 (36%) used anticonvulsants, and 1 (4%) used homeopathic remedies; 26 (47.27%) patients were satisfied with pain relief they obtained. All patients had spasticity lasting more than six months but only 36.4% of them used spasmolytics. Most of the patients 25 (45.45%) had back pain while painful spasms in lower limb had 17 (30.9%) and both symptoms had 13 (23.6%) of the patients. The average walking speed, measured by T25FW, of all participants was 0.76±0.25 (range 0.32 – 1.33). Subjective assessment of walking difficulty measured by WL was 24.2±7.5 (range 11-40). Median EDSS score was 5 (range, 3-6.5). **(Table 2)**

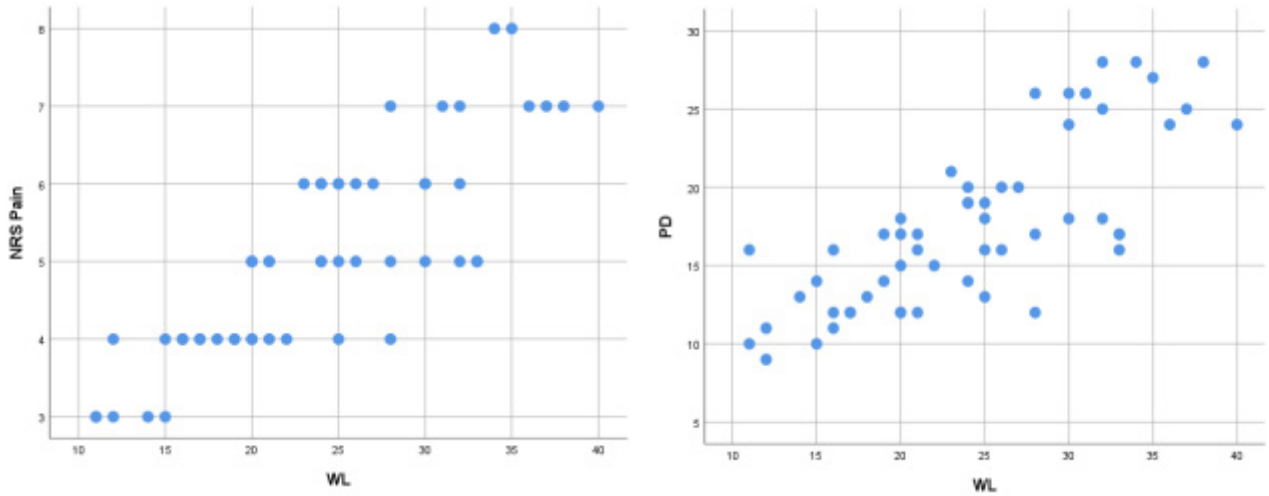
There is no statistically significant correlation between T25FW and P/D (r=-0.288; p=0.033). There is a statistically significant moderate negative correlation between T25FW and NRS pain score (rho=-0.475; p<0.001). Lower values of T25FW are associated with higher values of NRS pain score.

There is a statistically significant strong correlation between WL and NRS pain score (rho=0.825; p<0.001), as well as between WL and P/D (rho=0.770; p<0.001). Higher values of WL are associated with higher values of NRS and P/D.

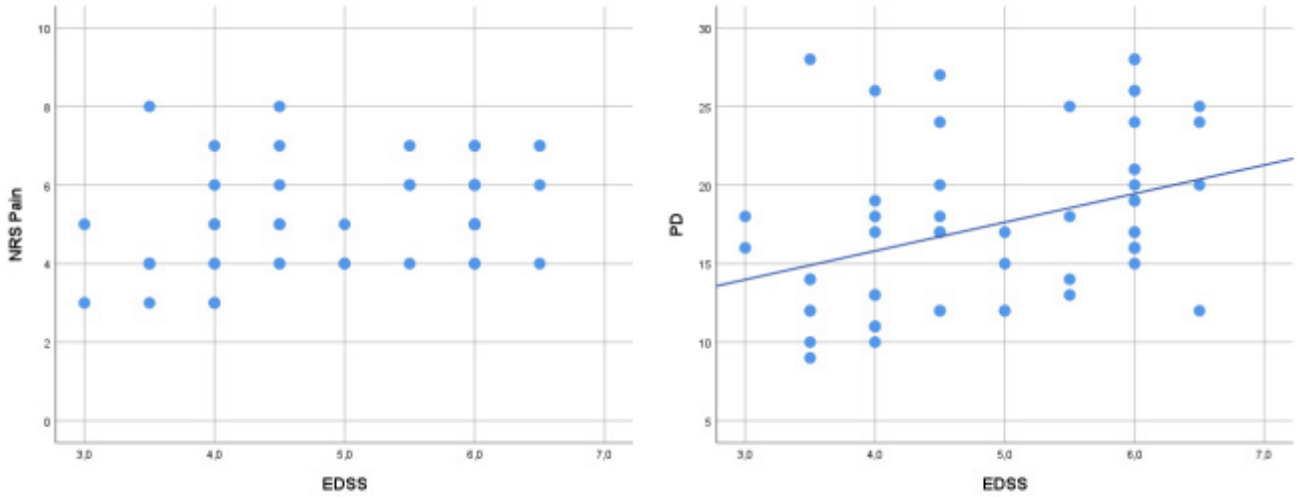
There is a statistically significant mild correlation between EDSS and NRS (rho=0.418; p=0.002) and between EDSS and PD (rho=0.392; p=0.003).



Graph 1. The relation between walking speed (T25FW) and pain intensity (P/D, NRS)



Graph 2. The relation between walk (WL) and pain intensity (NRS, P/D)



Graph 3. The relation between expanded disability status scale (EDSS) and pain intensity (NRS, P/D)

Summarizing the presented results, we can say that there is a significant strong correlation between WL and P/D (rho=0. 770; p<0.001) and between WL and NRS (rho=0. 825 p<0.001). In other words, the greater the intensity of pain, the more difficulty walking is percieved by patients. It has been shown that there is a statistically significant moderate negative correlation between T25FW and NRS pain (p<0.001). However, there is no statistically significant correlation between T25FW and pain intensity measured by PD (p=0.033). There is a statistically significant correlation between EDSS and pain intensity (NRS p=0.002; PD p=0.006) either. **Table 3.** The association of pain and walking speed and the degree of functional disability

DISCUSSION

Our research aimed at examining the association of pain with walking speed and functional disability in patients suffering from progressive forms of MS. According to literature (PubMed/Medline, Scopus and search engine of Google Scholar) the influence of pain on walking speed and functional disability regardless of the form of the disease has not been examined simultaneously yet. Our results indicated the presence of a significant strong correlation between subjective perception of walk (WL) and pain intensity (NRS)/feeling of discomfort (P/D). It was shown that there was a statistically significant moderate negative correlation between walking speed (T25FW) and pain intensity measured by NRS with no significant correlation with pain intensity measured by PD. There

Measuring instruments	T25FW	WL	EDSS
NRS	rho=-0.36; p=0.035	rho=0.831; p<0.001	rho=0.29; p=0.086
P/D	r=-0.288; p=0.033	rho=0.770; p<0.001	r=0.367; p=0.006

Rho – Spearman's rank correlation coefficient; r – correlation coefficient; p – p value; NRS – pain numeric rating scale; P/D – pain and discomfort; W – walk; T25FW – the timed 25 foot walk; EDSS – Expanded Disability Status Scale

was statistically significant correlation between pain intensity (NRS) and the feeling of pain and discomfort and the degree of physical disability (EDSS). This type of correlation indicates that pain therapy should be an integral part of the treatment these patients receive.

In our study we used T25FW as a clinical instrument for quantitative assessment of leg mobility and function and it proved to be valid for assessing walking speed in patients with MS (25). The respondents' average speed in relation to the degree of disability was slightly lower compared to the results of the study conducted by Langeskov-Christensen and colleagues (27). The aim of their study was to quantify walking impairment and perceived impact of MS on walking according to EDSS scores and to examine the relations between these parameters in 474 patients with MS. In the study, in moderate MS group (EDSS ≥ 4.5 and ≤6.5) most patients had progressive forms of MS (RR108, SP116, PP 50) with T25FW m/s: 0.93 ± 0.36 m/s. In this group walking speed correlates more closely to EDSS (-0.47) than in the mild group with lower EDSS (-0.37) with majority of patients with relapse remitting form of MS (27). The walking speed and functional disability of our patient were similar to patients in moderate group form Langeskov-Christensen and colleagues study. To assess gait, from patients' with spasticity point of view, we used a specific subscale of the WL questionnaire MSSS88 whose values indicated that our participants perceived a greater degree of gait impairment. Pain intensity was moderate in all participants in our study. There was a statistically significant strong correlation between NRS and subjective and objective measuring instruments for gait assessment. When it comes to subjective assessment of pain intensity using the P/D scale, there was a significant correlation with the subscale related to perceived gait impairment, whereas there was no correlation with walking speed. Freeman J et al., in their longitudinal study, show that P/D has moderate correlation with EDSS (20).

Based on a literature review (PubMed/Medline, Scopus and search engine of Google Scholar) there are no studies that examined a correlation between pain and walking speed in patients with MS, but gait was mostly viewed through a set of symptoms (muscle weakness, spasticity, tremor, emotional/mood disturbance, fatigue, or pain) that affect one's physical activity. Some studies showed that pain reduction together with spasticity reduction led to an improvement in walking speed after various treatments and interventions, and they thus indirectly showed that pain reduction affected the improvement of walking speed (28,29). The results of a study conducted by Jesse and colleagues are another indirect indicator of an association between walking speed and pain perception (30). They examined the association between fatigue perception and gait impairment with reference to pain through the subscale of Short form health survey (SF-36) in patients with MS who have a lower degree of disability (EDSS 2.6±0.7, 2-6). The results of SF-36 scales Physical functioning and Bodily pain, which measure the overall perception of general health, had negative correlations with gait measures in MS patients, i.e., self-perception of functional ability was reduced, and self-perception of bodily pain was increased in MS patients compared to healthy population (30). In addition, Motl and colleagues examined whether worsening of symptoms affected the level of physical activity in patients with all three forms of MS and the results showed that worsening of symptoms, including an increase in bodily pain, led to a significant decrease in the level of physical activity and functional ability (18). In a subsequent study, Motl and colleagues showed that fatigue and depression, but not pain, directly affected the level of overall physical activity on a sample of 269 patients with relapsing-remitting multiple sclerosis (RRMS). Based on the result of our research and according to the previous above-mentioned studies, the presence of pain significantly affects the performance and perception of impaired lower-extremity function in patients with progressive forms of MS.

The median EDSS score of our participants is between moderate and severe disability. It should be emphasized that EDSS score values and disease duration in our respondents are in accordance with the results of other studies conducted in our population, and that they are similar to the results obtained in groups of respondents with progressive forms of MS examined in other studies (31, 32). Our results are in line with the results obtained in several previous studies that indicated pain correlates with pain and was more common in case of increased disability and longer disease duration (6,10,33,34). Some clinical studies did not find any correlation but most of them included patients with lower EDSS scores and mostly with RRMS (35, 36, 37, 38).

The results of research conducted by Shahrbanian and colleagues indicated that the degree of disability in MS (measured by EDSS) was an important predictor of the presence and intensity of pain, patients with more severe disability were more likely to experience pain (39). Furthermore, compared to patients with MS, the results indicated that patients who experienced pain were more likely to have a more severe disability than those with no pain. These results suggest that the onset of pain and variation in pain intensity cannot be predicted solely on the basis of the disease or personal characteristics, but that other factors play an important role as well.

When it comes to a longitudinal follow-up of pain syndrome, there is inconsistency in the results of the studies that examined the association of pain and functional disability. Stenager and colleagues reported a higher prevalence of several pain syndromes with disease progression (initial mean of EDSS 3.4), especially in subjects with worsening EDSS (40). On the other hand, Brochet and colleagues obtained results that indicated a statistically insignificant reduction in the prevalence of pain in patients with a lower degree of disability in the early stages of the disease (median EDSS 2) (37).

One of the possible explanations of the association between pain intensity and functional disability was provided by Grau-López and colleagues (10). Evaluating other clinical characteristics associated with pain in MS, they observed that patients with progressive forms of the disease and a higher degree of disability (measured by EDSS scale) reported pain symptoms much more often than patients with minor neurological damage. When they analyzed the relationship between pain and neuroradiological findings they followed, they observed that patients who experienced greater pain intensity had a greater myelin disruption in the central nervous system and a greater likelihood of paresis, spasticity, and abnormal posture, so they were more likely to suffer from neuropathic and nociceptive pain as well. A special contribution of this study is the finding that patients with more spinal cord lesions (regardless of their location) are more likely to experience pain. This is supported by the results of the studie that dealt with the association between spinal cord injuries of various etiologies (with a special emphasis on traumatic lesions) and neuropathic pain (41). It was shown that spinal cord lesions may cause changes in survival, function and excitability of pathways responsible for pain transmission (the spinothalamic tract) secondary due to the reduction in inhibitory neurotransmitters such as GABA and glutamate and due to the release of inflammatory mediators such as free radicals, nitric oxide, and pro-inflammatory cytokines. These changes create an environment suitable for the possible development of pain at different levels.

A better understanding of the prevalence, nature, and course of MS-related pain, as well as the identification of the groups of patients who experience most severe pain may help to evaluate the real extent of this problem. Furthermore, a better understanding of MS-related pain epidemiology may contribute to a better understanding of the mechanisms of symptoms and potentially to the development of targeted treatment strategies.

Despite all the effort researchers and doctors have been investing in solving this problem for decades, the etiology of MS remains unknown, so treatment itself cannot be directed at the cause. There is a multidisciplinary approach to the treatment and therapeutic modalities are pharmacological and non-pharmacological and they are applied individually or are combined, depending on the needs of the patient. The basic postulate of MS treatment is that the therapy should be started as soon as possible, immediately after establishing the diagnosis, as any delay contributes to further deterioration and a faster development of neurologic and functional deficits. The presence of pain in MS patients contributes to the complexity of choosing the treatment concerning its efficacy, safety and costs. It is necessary to have a multimodal approach which includes pharmacotherapy, rehabilitation, psychotherapy, interventional procedures (transcranial direct-current stimulation, spinal cord stimulation, deep brain stimulation), and lifestyle modification in order to achieve the best treatment outcome and improve the quality of life of patients and their families.

Several limitations should be considered when interpreting the results of this study. We did not consider degree of spasticity, disease form and patients are not classified according to the degree of functional disability that can has effect on the measured outcomes. We only included patients with back pain and painful spasms in lower extremities without considering other types of pain. Our study included only participants with progressive forms of MS. Pain was only evaluated with questionnaires without supporting it with magnetic resonance imaging findings. We did not compare outcome measures between patients with PPMS and SP MS because of small number of patients.

CONCLUSIONS

The results of our study indicated a significant negative impact of pain on walking speed and on functional disability. The association between pain and other factors in MS has been widely studied but remains controversial due to inconsistencies regarding numerous clinical and personal factors. The small number of available studies and the diversity of their design presented an obstacle and made it difficult for us to compare our results with the results of previous studies.

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Conflicts of Interest: The authors declare no conflict of interest.

Ethical approval: The study was conducted according to the guidelines of the Declaration of Helsinki. The Clinic for rehabilitation „Dr Miroslav Zotović“ Ethics Committee approved this study (No.32-2226/2).

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POVEZANOST BOLA SA BRZINOM HODA I FUNKCIONALNOM SPOSOBNOŠĆU KOD PACIJENATA OBOLELIH OD PROGRESIVNIH FORMI MULTIPLE SKLEROZE

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Sažetak

Uvod/Cilj: Kod progresivnih formi multiple skleroze učestalost bola raste sa tokom bolesti, utiče na funkcionalnu sposobnost pacijenata i čini je mnogo kompleksnijom. Sproveli smo studiju preseka u cilju ispitivanja povezanosti bola sa brzinom hoda i funkcionalnom sposobnošću pacijenata obolelih od progresivnih formi multiple skleroze.

Metod: U periodu od januara 2020. do maja 2023.godine u Klinici za rehabilitaciju „Dr Miroslav Zotović" sprovedena je studija preseka. Istraživanjem je obuhvaćeno 55 ispitanika sa dijagnostikovanom primarno progresivnom i sekundarno progresivnom multiplom sklerozom, konsekutivno primljenih na rehabilitaciju. Prikupljani su demografski i socio-epidemiološki podaci i podaci vezani za bolest. Intenzitet bola je procenjivan *Numeričkom skalom* (NRS). Obzirom da su svi pacijenti imali spasticitet bol je procenjivan i subskalom upitnika *Multiple Sclerosis Spasticity Scale 88 (MSSS-88)* koja se odnosi na Bol/Nelagodnost (*Pain/Discomfort*, P/D). Subjektivna percepcija oštećenja hoda procenjivana je subskalom istog upitnika koja se odnosi na hod (WL – Walk). Brzinu hoda smo merili kliničkim instrumentom – *The Timed 25 Foot Walk* (T25FW). Funkcionalna procena i svi upitnici su popunjavani u jutarnjim časovima u toku 24h od dana prijema pacijenata na rehabilitaciju.

Rezultati: Postoji značajna jaka pozitivna povezanost između WL i P/D (rho=0,770; p<0,001) i WL i NRS (rho=0,825 p<0,001). Pokazano je da postoji statistički značajna osrednja negativna povezanost T25FW i NRS bol (p<0.001). Ne postoji statistički značajna povezanost između T25FW i intenziteta bola merenog P/D (p=0,033). Takođe, pokazana je statistički značajna povezanost EDSS i intenziteta bola (NRS p=0,0002; PD p=0,006).

Zaključak: Rezultati istraživanja su ukazali na značajan negativan uticaj bola na brzinu hoda i na stepen funkcionalne onesposobljenosti.

Ključne reči: bol, brzina hoda, funkcionalna onesposobljenost, progresivne forme multiple skleroze

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