Disability assessment due to stroke

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ABSTRACT

Objectives: The main purpose of the study is to determine the frequency of stroke in patients who applied to the disability board. The secondary aim of the study is to determine the factors affecting disability rates in patients who applied to the disability board due to stroke.

Methods: Patients over the age of 18 who applied to the physical medicine and rehabilitation outpatient clinic for disability assessment were included in the study. Disability board files of all patients were scanned retrospectively and the information obtained was recorded.

Results: It was found that 9.1% of patients who were evaluated for disability and were found to have any level of disability experienced disability due to stroke. A statistically significant relationship was found between stroke-related disability score and advanced age, female gender, and the presence of aphasia and dementia in the patients (p < 0.05). However, no statistically significant relationship was found between the type of stroke, the affected side and the stroke-related disability scores (p > 0.05).

Conclusions: Stroke patients constitute a remarkable part of disability assessment. When evaluating stroke patients in terms of their disability, comorbid diseases and demographic characteristics of the patients should also be taken into consideration.

Keywords: Stroke, disability, community health

DISABLED INDIVIDUAL; IT REFERS TO THE INDIVIDUAL WHO IS AFFECTED BY THE ATTITUDES AND ENVIRONMENTAL CONDITIONS THAT RESTRICT HIS FULL AND EFFECTIVE PARTICIPATION IN SOCIETY ON EQUAL TERMS WITH OTHER INDIVIDUALS DUE TO THE LOSS OF HIS PHYSICAL, MENTAL, SPIRITUAL AND SENSORY ABILITIES AT VARIOUS LEVELS. IF THE DISABILITY IS; THESE ARE THE RATINGS AND CLASSIFICATIONS THAT DETERMINE THE DISABILITY OF THE INDIVIDUAL DUE TO TISSUE, ORGAN AND/OR FUNCTION AND PSYCHIATRY DIAGNOSIS AND RELATED LOSS OF REASONING ABILITY, BASED ON INTERNATIONAL METHODS. DISABILITY STATUS ASSESSMENT; IT COVERS THE EVALUATION OF DISEASE SEVERITY, ORGAN OR FUNCTION LOSS WITH THE AIM OF DETERMINING DISABILITY [1]. IT IS IMPORTANT THAT DISABILITY IS EVALUATED IN A STANDARD WAY ACCORDING TO THESE RATINGS, SO THAT DISABLED PEOPLE CAN BENEFIT FROM THE RIGHTS PROVIDED BY SOCIAL SUPPORT SYSTEMS.

Disability and stroke in China, with more than 2 million new cases per year [6]. Studies on stroke-related disability rates and associated risk factors in our country are limited. The rate of severe disability was found to be 57% in stroke patients who applied to the health board for disability assessment, and severe disability was associated with right-sided involvement, advanced age, dementia, and aphasia [7]. In another study, disability was found in 145 (4.2%) people out of 3443 selected by stratified sampling method in Kayseri province, and disability was found to be more common especially in women [8].

The main purpose of the study is to determine the frequency of stroke in patients who applied to the disability board. The secondary aim of the study is to determine the factors affecting disability rates in patients who applied to the disability board due to stroke.

**METHODS**

The study was carried out retrospectively and cross-sectionally in the physical medicine and rehabilitation outpatient clinic of Bursa Uludağ University. In this context, the medical records of 620 patients who applied to the outpatient clinic for disability status evaluation between November 15, 2019 and November 15, 2020 were retrospectively reviewed. Patients younger than 18 years of age were not included in the study because they did not comply with the regulations on disability assessment for adults. Apart from this, patients who applied for disability assessment but were not found to be disabled and patients whose disability board files could not be accessed were excluded from the study. When the patients were classified, those who had a stroke due to causes other than vascular stroke were considered to be admitted due to non-stroke causes. Among the disabled patients, the proportion of patients who applied to us for disability assessment due to stroke was determined. In addition, patients who applied for stroke were grouped separately and the factors affecting the disability rates of these patients were tried to be determined. The study was conducted in accordance with the principles of the
declaration of Helsinki, with the approval of Bursa Uludağ University School of Medicine Clinical Research Ethics Committee (decision no: 2020-21/13, date: 25/11/2020).

**Statistical Analysis**

Analysis of the study was performed using SPSS (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.) statistical analysis program. Conformity of continuous variables to normal distribution was examined with the Shapiro Wilk test, and the Mann Whitney U test was used for comparisons between groups according to the test result. In addition, Spearman correlation analysis was performed to evaluate the relationship between numerical data. Descriptive statistics are given as unit number (n), percentage (%) and median (minimum-maximum). Statistical significance was taken as 0.05 in the analysis.

**RESULTS**

Medical records of 620 patients over the age of 18 who applied to the disability board and were evaluated in the outpatient clinic were reviewed retrospectively. 503 of these patients were included in the study. The patients who were not included in the study were excluded because the disability board files could not be reached in the system or the disability was not detected. Stroke-related disability was detected in 46 patients. The flow chart of the study is given in Fig. 1. The status of stroke patients among the disabled patients is given in Table 1. A strong positive correlation was found between stroke-related disability score and age ($p < 0.001, r = 0.676$) (Table 2). In addition, a statistically significant relationship was found between stroke-related disability score and female gender, dementia and aphasia coexistence ($p < 0.05$) (Table 3). However, there was no statistically significant relationship between stroke-related disability score and the affected side and type of stroke ($p > 0.05$) (Table 3).

**DISCUSSION**

Stroke is one of the leading causes of disability associated with a neurological disease. Yang et al. [9] found the long-term disability rate after stroke to be 45%. Bensenor et al. [10] found the prevalence of post-stroke disability to be 29.5% in men and 21.5% in women. In the study of Teh et al. [11], it was determined that the dependence of elderly individuals who had a stroke in Singapore to another individual increased due to stroke. Another study, it was found that the Rankin Disability scores of 67.6% of stroke patients were negatively affected [12]. In general, we can say that stroke causes significant disability. We did not look at the prevalence of stroke-related disability in our study. We aimed to review the status of patients with stroke-related disability among other disabling musculoskeletal diseases. 9.1% of the patients included in the study were experiencing disability due to stroke. This situation showed a considerable rate among the disability status applications. In the study of Türkel et al. [13], at the end of the 6-month follow-up of stroke patients under 65 years of age, a significant functional improvement was observed in most of the patients. We know that functional

<table>
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<th>Table 1. General distribution of patients with disability</th>
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<tr>
<td><strong>n</strong></td>
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<tr>
<td>Stroke-related disability</td>
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<td>Disability due to non-stroke causes</td>
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<th>Table 2. Disability rates and age</th>
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<td><strong>Stroke-related disability scores</strong></td>
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<td>Correlation coefficient (r)</td>
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<td>Age</td>
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<td>Median</td>
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Data are expressed as median (minimum-maximum).
Disability and stroke recovery is more common especially in the early stages after stroke. From this point of view, the evaluation period of the patients will affect the level of disability. In our study, we did not evaluate stroke patients in terms of disability in the acute phase, where the condition of the patients can change rapidly and we cannot make a clear decision in terms of disability. The disability status assessment of the patients we evaluated was made at least 3 months after the event date.

In the study of Martin et al. [14], female gender was associated with increased disability in atrial fibrillation-related stroke. Kes et al. [15] found that advanced age and female gender were associated with increased disability at discharge in stroke patients. Because stroke pathology varies depending on sex [16], disability may vary after stroke. In our study, stroke-related disability scores were found to be statistically significantly higher in female patients than in male patients ($p < 0.05$). Since the patients we included in the study were selected only among the patients who applied to the disability board, they could not fully reflect the stroke patients in the community. Therefore, we cannot make a definitive judgment between sex and stroke-related disability.

In the study of Oyewole et al. [17], post-stroke disability status increased with advanced age. Lee et al. [18] found that recurrent stroke was associated with advanced age. Based on this, it was concluded that recurrent stroke is associated with increased disability in individuals, and disability due to stroke increases with advanced age [18]. Farzadifar et al. [19] found in their study that advanced age was associated with increased disability. In our study, stroke-related disability scores increased significantly with increasing age ($p < 0.001$). In the correlation analysis, a strong positive correlation was found between age and disability scores ($r = 0.676$). In this respect, we can say that our results are compatible with the literature.

In one study, no significant difference was found between the affected extremity in stroke and the quality of life of patients [20]. Oyewole et al. [17] found that right dominant extremity involvement was associated with worse disability status. In our study, although the disability scores were higher in the right-sided affected patients, no statistically significant relationship was found between the affected side and disability scores ($p > 0.05$). In fact, this situation is contradictory considering that the dominant extremity

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<th>Table 3. Disability rates and related factors</th>
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<td>Patients evaluated for stroke-related disability</td>
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<tr>
<td>Sex</td>
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<tr>
<td>Women</td>
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<tr>
<td>Men</td>
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<tr>
<td>Aphasia</td>
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<tr>
<td>Yes</td>
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<td>No</td>
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<td>Dementia</td>
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<tr>
<td>Yes</td>
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<tr>
<td>No</td>
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<tr>
<td>Stroke type</td>
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<tr>
<td>Hemorrhagic</td>
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<td>Ischemic</td>
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<td>Affected side</td>
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<td>Right</td>
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<td>Left</td>
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Data are expressed as n (%) and median (minimum-maximum).
is the right side in most of the population. Normally, patients affected by the dominant side are expected to score higher in the upper extremity according to disability legislation. Since the upper and lower extremity disability scores of most of the patients we evaluated were not written separately, whether the side involved between the upper extremities was effective or not could not be compared. Therefore, we cannot reach a clear conclusion on this issue.

In one study, the presence of aphasia was associated with poor functional outcomes in stroke patients [21]. Flowers et al. [22] found that patients with aphasia 28 days after stroke had more disability. In another study, it was stated that the coexistence of stroke and dementia was associated with an increase in disability status [23]. In our study, we thought that disability in stroke patients may be related to comorbidities. Of the stroke patients included in our study, 41.3% had aphasia and 21.7% had dementia. Stroke-related disability scores of patients with both aphasia and dementia were found to be statistically significantly higher ($p < 0.001$).

Rehabilitation is widely used to reduce disability and improve functional status in stroke patients [24]. In a systematic review, it was concluded that home-based rehabilitation program is effective in reducing disability in stroke and other diseases that cause physical disability [25]. In our retrospective analysis, we could not determine whether most of the patients received rehabilitation in the disability status reports. Therefore, we cannot comment on the relationship between disability and rehabilitation.

In a study, 56% of patients with ischemic stroke and 49% of patients with hemorrhagic stroke were found to be severely disabled at discharge [26]. In another study, patients with hemorrhagic stroke were found to have lower quality of life and mobility scale scores than patients with ischemic stroke [27]. Another study found a strong association between hemorrhagic stroke and worse lower extremity function [28]. In general, ischemic stroke is more common, but hemorrhagic stroke is thought to be responsible for more deaths and disability-adjusted life-year losses [29]. In our study, it was concluded that the type of stroke did not have a statistically significant relationship with the disability scores of the patients ($p > 0.05$). The reason why our study differs from the literature may be due to the fact that the patients who applied to the disability board did not show all stroke patients in the community homogeneously.

**Limitations**

There have been some limitations in our study. First of all, the study was a retrospective study. In addition, since the patients we evaluated were selected only from among the patients who applied to the disability board of our hospital, we do not reflect all the stroke patients in the society homogeneously, and therefore we cannot form a general judgment. Finally, the evaluation of the patients only in terms of the pathology constituting the disability rate prevented us from looking at the event from a broad perspective.

**CONCLUSION**

In conclusion, stroke patients constitute a significant portion of disability status assessment. When evaluating stroke patients in terms of disability, comorbidities and demographic characteristics of patients should also be taken into account.

**Authors' Contribution**

Study Conception: UE; Study Design: UE; Supervision: UE; Funding: UE; Materials: UE; Data Collection and/or Processing: UE; Statistical Analysis and/or Data Interpretation: UE; Literature Review: UE; Manuscript Preparation: UE and Critical Review: UE.

**Conflict of interest**

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

**Financing**

The authors disclosed that they did not receive any grant during conduction or writing of this study.

**REFERENCES**

Disability and stroke

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