



Prevalence of Physical Decline in Patients with Post-Stroke Cognitive Impairment

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Abstract

Cognitive impairment following a stroke is widespread and can significantly impede function recovery and the ability to resume daily activities. It found that indicators such as gait speed and mobility-based daily activities are reduced in patients with cognitive impairment, implying that cognitive status has a functional impact and can be linked to functional outcomes in a variety of diseases, including stroke. Health practitioners utilize a variety of clinical tests to assess various aspects of cognitive capacity. One of these scales is Stroke Impact Scale (SIS) 3.0 which intended to be administered repeatedly in order to monitor the effects of a stroke on the health and quality of life of survivors over time. Thus, the SIS 3.0 could be used after rehabilitation to investigate further elements such as physical strength, mobility, and the ability to use the affected hand. The results showed that a substantial proportion of patients (at least one third) reported some motor deficit post stroke rehabilitation with (24.5%) reported some decline in their arm strength; (12.2%) reported having a little strength in his grip; and (17.1%) said that they have a bit of decline in their strength in the affected leg. Also, the number of participants who reported a difficulty in their ability to be mobile at home and/or in the community increased more than 50% with complex active mobility ranged between 34.1% and 66%. In addition, the ability of using the hand most affected by stroke showed one in every five post-stroke patients were unable to perform any task. In conclusion, this study discovered that the stroke review clinic's SIS indicated physical deterioration as well as cognitive problems following stroke. Using SIS in a systematic, standardised manner allows for the identification of changes in physical performance, allowing for further support and appropriate rehabilitation where needed.

Keywords: Physical Decline; Post Stroke; Cognitive Impairment; Stroke Impact Scale

Abbreviations

SIS: Stroke Impact Scale

Introduction

Any cognitive area, including executive function, memory, language, visuospatial ability, visuoconstructional ability, and global cognitive function, might experience cognitive impairment

following a stroke. Cognitive impairment following a stroke is widespread and can significantly impede function recovery and the ability to resume daily activities [1]. It found that indicators such as gait speed and mobility-based daily activities are reduced in patients with cognitive impairment, implying that cognitive status has a functional impact and can be linked to functional outcomes in a variety of diseases, including stroke. There is a lack of research

on the relationship between cognitive deficits and ambulatory function recovery after stroke, and the importance of cognitive function in this process has been underestimated. Patients with post-stroke cognitive impairment may lack awareness and motivation to pursue therapy. It is also reasonable to expect that cognitive impairment, such as attention deficit disorder, may hinder motor learning, which is necessary for post-stroke gait training. The role of cognitive function to the recovery of functional mobility following a stroke can also be deduced, since the significance of cognitive function for functional mobility has lately been recognized in neurology conditions [7]. Furthermore, a history of previous stroke and pre-morbid cognitive state are seen as significant indicators of recovery [2].

Health practitioners utilize a variety of clinical tests to assess various aspects of cognitive capacity. One of these scales is Stroke Impact Scale (SIS) 3.0 which intended to be administered repeatedly in order to monitor the effects of a stroke on the health and quality of life of survivors over time. It can also be used in clinical and research applications [3]. It was developed in 2003 and assesses 59 items of a patient's quality of life, divided into eight dimensions where a stroke has an overall effect on health and well-being [4]. Internal consistency reliability (Cronbach's α) was high in all SIS 3.0 domains and ranged from 0.89 for the emotional domain to 0.98 for the physical domain [3]. The test-retest reliability showed high intra-class correlations, which ranged from 0.79 for the SIS 3.0 stroke global recovery item to 0.93 for the cognitive and physical domains [3].

In general, post-stroke rehabilitation interventions are delivered within the first three months following the stroke deficit [5]. Thus, the SIS 3.0 could be used after rehabilitation to investigate further elements such as physical strength, mobility, and the ability to use the affected hand. Moreover, this is a patient reported outcome measure designed to detect the impact of the current stroke deficits on the quality of life to be quantified. Carod-Artal, *et al.* [6] assessed the psychometric attributes of SIS 3.0 in stroke survivors ($n = 174$) and found that it could be used to evaluate health-related quality of life. Another study examined SIS 3.0 to explore clinical changes in everyday life at three and twelve months post-stroke, revealing that the strength were lower at twelve months than at three months [5].

The recognition and identification of specific post-stroke physical decline affected by cognitive impairment is essential, so that focused physical rehabilitation, and social support can be provided where appropriate. Such an investigation will provide an opportunity to review any unmet needs in the stroke rehabilitation follow-up service. The purpose of this study was to identify the prevalence of physical decline in patients with post-stroke cognitive impairment and have completed a stroke rehabilitation program using SIS 3.0.

Materials and Methods

50 medical records of stroke survivors attending a stroke review clinic at the Assessment and Treatment Centre in St. Finbarr's Hospital were reviewed, 9 medical records excluded for another neurological diseases. This clinic is led by an Advanced Nurse Practitioner in Stroke. Patients are generally reviewed between 6 and 12 weeks after completed inpatient rehabilitation. Their function is measured, risk factors for stroke addressed and they also complete the Stroke Impact Scale at this clinic. The inclusion criteria to review the records were as follows; (a) post-stroke patient must be 65 years old or more; (b) post-stroke patient must complete stroke rehabilitation at St Finbarr's hospital; (c) post-stroke patient must be reviewed at stroke clinic at assessment and treatment centre at least six week after discharge from the hospital at St Finbarr's hospital; (d) post-stroke patient must have completed Stroke Impact Scale; (e) post-stroke patient was been assessed using MoCA or MMSE at admitting or discharging from the hospital if possible; (f) it must be his/her first ever stroke; (g) only stroke patient is eligible for the study; and (h) it must be admitted to the hospital.

The exclusion criteria to review medical charts were as follows; (a) post-stroke is less than 65 years old; (b) post-stroke patient did not complete his/her rehabilitation program at the time of the study; (c) post-stroke patient completed his/her rehabilitation in another hospital; (d) post-stroke patient have not reviewed yet at stroke review clinic in assessment and treatment centre yet. (e) post-stroke patient did not complete Stroke Impact Scale; (f) he/she had a recurrent stroke; (g) having another neurological diseases alongside the stroke; and (h) other neurological disease that would potentially affect cognition prior stroke onset.

Results and Discussion

Physical strength: patient reported deficits

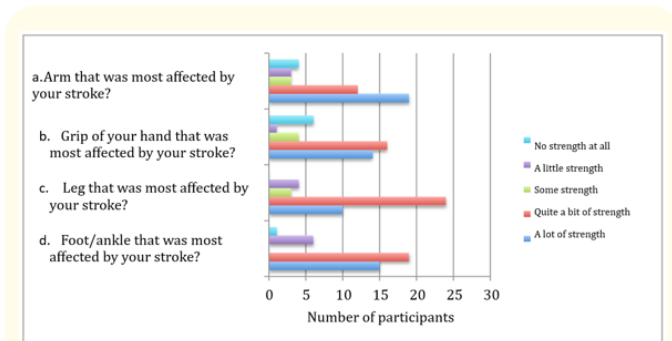


Figure 1: Physical strength of the affected side of the body after stroke (n = 41).

Post stroke patients who came to assessment and treatment centre after completing rehabilitation program with new symptoms of cognitive impairments. The histogram above details the patient responses to four questions of the Stroke Impact Scale enquiring about the physical problems that may have occurred after completed their rehabilitation program. Although the majority of those who responded to the questions answered that they felt quite a bit of strength in their hand, grip, leg, foot/ankle over the past week after discharge from the hospital, a substantial proportion of patients (at least one third) reported some motor deficit post stroke rehabilitation with (24.5%) reported some decline in their arm strength; (12.2%) reported having a little strength in his grip; and (17.1%) said that they have a bit of decline in their strength in the affected leg. This result correlates with a prior study aimed to identify cognitive impairments in patients with recent stroke who had completed a stroke rehabilitation program using SIS 3.0. showed that around one third of the participants reported difficulty in their memory and thinking and 43.9% of the participants experiencing difficulty in solving everyday problems [8].

Mobility

Figure 2 shows information about the number of participants who reported a difficulty in their ability to be mobile at home and/or in the community. An overall, nine questions were asked to each

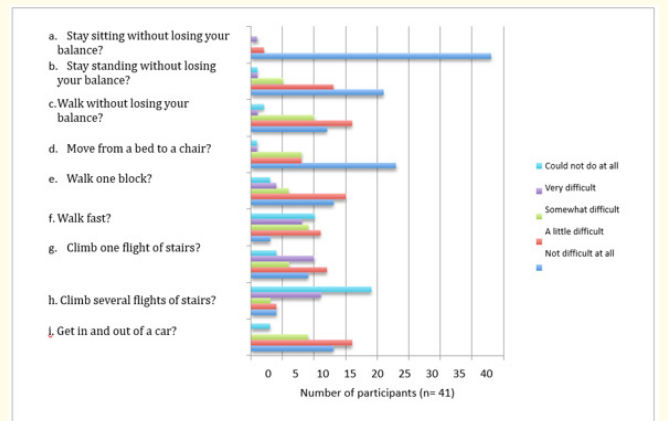


Figure 2: Post stroke mobility, at home and in the community (n = 41).

participant. It is clear that the majority of the responses to static balance were positive and dynamic balance were negative. The first question asked that participants to stay sitting without losing balance; 38 participants (92%) indicated that it was not difficult at all to do it. The following question asked the participants to stay standing without losing balance.

Question four asked the participants to rate their difficulty in movement from a bed to a chair. One third of the participants indicated having a little difficulty or some difficulty. 34 participants (83%) stated having no difficulty at all (51%) or having a little difficulty (32%). Question three aimed to identify the participant’s response regarding to their walking status without losing balance. Nearly 5% of the participants could not do it at all whereas the rest of the participants experienced various degrees of difficulty. Question four asked the participants to rate their difficulty in movement from a bed to a chair. One third of the participants indicated having a little difficulty or some difficulty.

In addition, question five designed to ask the participants to rate the difficulty in walking one block. We can see that just over one third of the participants indicated that having a little difficulty and approximately this proportion increased two times with the participants who stated having difficulty in their walking speed (34.1%) and (66%) respectively. Questions seven and eight aimed to test the participants’ ability to climb stairs in one flight and

in several flights. The results showed that around 49% of the participants experienced moderate difficulty with climbing one flight of the stairs and around 46.3% of them could not climb several flights of the stairs. The last question was about getting in and out of the car. The overall responses were whether having a little difficulty (39%) or do not have difficulty at all (31.7%). Previous studies reported some changes in mood, in terms of depression, were noted among the participants in the stroke review clinic. Nearly 51.2% of participants (n = 21) felt sad, 17.1% of participants (n = 8) felt a burden to someone, 39% of them (n = 16) did not enjoy things as much as they had previously, 85.4% felt depressed (felt that life was not worth living) and 33 participants (80.5%) did not smile or laugh at least once a day [8]. These results concur with a study conducted by Kauhanen, *et al.* [9] who reported that over half the participants in their study developed post-stroke depression at three months.

The ability to use the affected hand

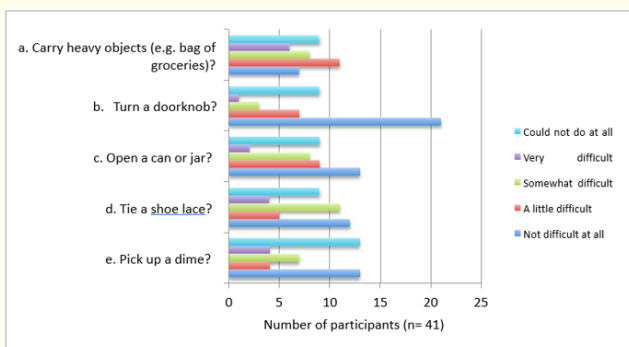


Figure 3: Ability to use hand that was most affected by stroke (n = 41).

Figure 3 pertains to the ability of using the hand most affected by stroke. With regard to question one, second, third, and fourth, the participants were asked about how difficult was to carry heavy objects, turn a doorknob, be able to open a can or a jar, and tie a shoelace using their affected hand. It can be seen that one in every five post-stroke patients were unable to carry heavy objects using their affected hand. The last question asked the participants to pick up a coin with their affected hand. The proportion of the participants who stated that could not do it at all was 31.7%. In relation to this domain, some studies suggested

that the impairment in the prefrontal cortex could lead to executive dysfunction, such as the inability to make a decision and difficulty in planning [10]. Also, prior studies have noted the importance of executive function rehabilitation, as between 19% and 75% of stroke survivors presented with executive dysfunction [11,12]. This study suggests that executive function rehabilitation would improve different aspects of functions, especially those that focus on planning, multitasking and making decisions.

Conclusion

This study discovered that the stroke review clinic's SIS indicated physical deterioration as well as cognitive problems following stroke. Using SIS in a systematic, standardised manner allows for the identification of changes in physical performance, allowing for further support and appropriate rehabilitation where needed. These issues may be addressed if healthcare providers encouraged stroke survivors to report any changes in their cognitive status after completing their rehabilitation program. This study serves as a foundation for future research by examining the current evaluation instruments used to investigate physical performance affected by post-stroke cognitive abnormalities.

Conflict of Interest

The author declares that he has no competing interests.

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