Strength Perception and Performance in Stroke Patients

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Introduction

Stroke is the leading cause of disability in the world. The incidence in The Netherlands is of 45.000 cases per year. (1)

Patient Reported Outcome Measures (PROM) gather information about patient experiences and perception of the disease. They are not frequently used after stroke compared to other diseases (2)

The Stroke Impact Scale (SIS) is the most common PROM used in stroke patients. It can measure patient's perception of strength. The Motricity Index (MI) can be used to objectively assess strength.

Understanding the relationship between perception and objective strength might encourage the use of PROMs, contributing to a patient centered care which is characterized by better health outcomes. (3)

Research Question: What is the relationship between SIS and MI strength outcomes in upper and lower extremity stroke patients after discharge from inpatient care to the home and community care?

Methods

Design: Cross sectional study

Recruitment: 4 hospital units in the Netherlands

Inclusion criteria
1. Having a first ever Stroke
2. Being discharged from institutional care to home and community setting
3. Participant > 18 years
4. Scoring > 18 on the Barthel Index
5. Consent form signed

Measurement tools:

SIS → Strength Perception (1a, 1b, 1c, 1d)

MI → Objective Strength (1-6)

Of Upper & lower extremity

Statistical analysis

▪ Demographic data
Characteristics of participants

▪ National Institutes of Health Stroke Scale
Severity of stroke symptoms

▪ Spearman correlation test
Correlation: SIS&MI

0.0 - 0.15 = no correlation
0.15 - 0.25 = low correlation
0.25 - 0.40 = moderate correlation
0.40 - 0.75 = strong correlation
0.75 -1.00 = very strong correlation

▪ Two way contingency table
Relationship: SIS & MI

Results

Table 1 Characteristics of participants (n=156)

Characteristics		Number
Sex	Male	100
	Female	56
Age (median)		69
Level of education	Low	111
	High	45
Discharge destination	Home	120
	Rehab Centre	19
	Geriatric Rehab	17
NIHSS (median)		3

SD = Standard Deviation;
NIHSS = National institute of Health Stroke Scale

Table 2 Correlation between the SIS and the MI in different body parts

Body parts	Correlation
ARM	rho 0.60*
HAND	rho 0.60*
LEG	rho 0.55*
ANKLE	rho 0.53*
Upper extremity	rho 0.61*
Lower extremity	rho 0.60*

SIS = Stroke Impact Scale (items 1a, 1b, 1c, 1d); MI = Motricity Index (items 1 to 6); Rho=Spearman's rank correlation coefficient. *Correlation is significant at the 0.01 level.

Table 3 Patient reported strength in relation to objective strength assessment

Measured Strength MI		Reduced MI	Good MI	All
ARM strength SIS1a	Reduced	17	15	32
	Good	9	115	124
	All	26	130	156
HAND strength SIS1b	Reduced	25	13	38
	Good	10	108	118
	All	35	121	156
LEG strength SIS1c	Reduced	17	10	27
	Good	7	122	129
	All	24	132	156
ANKLE strength SIS1d	Reduced	15	8	23
	Good	6	127	133
	All	21	135	156

MI = Motricity Index; CI = 95% confidence interval; SIS=Stroke Impact Scale questions 1a, 1b, 1c and 1d; Sens=sensitivity; Spec=specificity.

Table 1 shows the characteristics of the participants. In Table 2, the 'strong correlations' between the SIS and the MI. Table 3 shows the relationship between dichotomized SIS and MI outcomes. Dark blue colours indicate the number of patients overestimating strength and yellow colours patients underestimating strength.

Discussion & Conclusion

There is a strong correlation between the strength outcomes of the SIS and the MI in both upper and lower extremity. However, some patients had a different perception of strength in comparison with their objectively measured strength. There was a tendency to underestimate strength rather than overestimate it.

Although the SIS and the MI have proven high validity and reliability, the construct difference might have influenced the results. The SIS focuses on perceived strength while the MI focuses on level of paresis.

PROMs such as the SIS give useful information about the patients' perception of strength, when used in addition to objective measurements such as the MI.

Recommendations

Increasing the use of PROMs such as the SIS, in addition to objective measures such as the MI, for evaluating strength in stroke patients. Also, setting rehabilitation goals in accordance to both objective and self-reported measures of function.
Future research is advised to develop new self reported and objective tools to use at every recovery stage covering similar constructs.

1. W.F.H. Peter et al. KNGF Guideline. J Phys Ther. 2010;120.
2. Stewart JC, Cramer SC. Patient-reported measures provide unique insights into motor function after stroke. Stroke. 2013;44:1111–6.
3. Institute of Medicine & Committee on Quality of Health Care in America. A New Health System for the 21st Century. Vol. 323, BMJ : British Medical Journal. 2001. 1192 p

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