ICF AND STROKE
MKF IN MOŽGANSKA KAP

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Abstract

In spite of a large number of existing scales for stroke outcome assessment, the problem of precise, holistic and unified international scale for use by clinicians, researchers and policy-makers is still under discussion. International Classification of Functioning (ICF) is a tool elaborated by the World Health Organisation in order to provide a multi-dimensional framework for health and disability. ICF aims to provide a conceptual basis and an universal common language for describing and understanding patient's health status, reaching beyond mortality, diseases and medical diagnoses. Some studies have shown that ICF is efficient for assessing stroke outcomes and may represent an interesting alternative to be used for reaching better outcomes in the rehabilitation process, as well as for research and policy-making purposes.

Key words:
ICF, stroke rehabilitation, disability

Izvleček

Čeprav obstaja veliko lestvic za ocenjevanje izida po možganski kapi, ostaja problem natančne, celostne in poenotene mednarodne lestvice za potrebe kliničnega dela, raziskovanja in javnozdravstvenega odločanja odprt. Mednarodna klasifikacija funkcioniranja, zmanjšane zmožnosti in zdravja (MKF, angl. skrajšano ICF) je orodje, ki ga je razvila Svetovna zdravstvena organizacija kot večrazsežen okvir pojmovanja zdravja in zmanjšane zmožnosti. MKF nudi pojmovne temelje in univerzalen skupni jezik za razumevanje in opis bolnikovega zdravstvenega stanja in presega razvrstitve po umrljivosti, boleznih in po medicinskih diagnozah. Nekaj študij je pokazalo, da je MKF učinkovita za ocenjevanje izida po možganski kapi in je lahko zanimiva alternativa v prizadevanjih za izboljšanje izida rehabilitacije, kakor tudi za uporabo pri raziskovalnem delu in odločanju v okviru zdravstvene politike.

Ključne besede:
MKF, rehabilitacija po možganski kapi, zmanjšana zmožnost

INTRODUCTION

Stroke is a major health problem that is among the most common causes of death and disability, especially in industrialized societies. Many people who have survived stroke are facing its long-term consequences, which are usually complex and heterogeneous and may result in problems across multiple domains of functioning (1). Lack of a compherensive, standard and universal international tool for the evaluation and measurement of stroke outcomes has been a major difficulty for practitioners, researchers and policy makers. The use of the International Classification of Functioning, Disability and Health (ICF) as such a tool is currently under active debate.

ASSESSMENT OF STROKE OUTCOMES – AN OVERVIEW

Following stroke, health status measures may be used for the examination and description of stroke impact, for monitoring, intervention evaluation, quality management, surveys, for individual as well as macro-level health-care planning and decision making. Most frequently, the effects of stroke are assessed by methods such as health professional ratings and performance tests. However, stroke survivors' everyday lives are affected in a variety of ways not easily captured by this type of method. Some health-related quality of life measures provide additional patient-centered approach to specify consequences of stroke (2). According to the US Agency for Health Care Policy and Research, there are more than 30 scales used for different purpuses – e.g., prehospital assessment, acute phase scales, functional assessment, and outcome assessment – which makes any comparison even at the national level a very challenging task (3). Some of these scales are briefly described in Table 1.

In the recent years, there has been a growing awareness that stroke assessment should extend beyond the traditional outcome of mortality and neurological symptoms to include physical, psychological and social functioning. This approach is being increasingly applied in health care and research, especially in rehabilitation medicine (1). Several national and international guidelines on stroke management

have been published also containing recommendations on interventions and assessment strategies targeted towards the diverse areas of post-stroke disability to be considered beyond the acute phase of the disease. In one of the recent European recommendations concerning the organization of stroke care by the European Stroke Initiative (EUSI), the careful assessment of the degree of disability in post-stroke patients is regarded as most important. According to the EUSI recommendation, disability assessment should comprise the domains of motor weakness, sensory and proprioceptive deficits, intellectual impairment, and emotional distress and motivational disturbances. However, no recommendations on specific instruments to be used for the measurement of these areas are given (4). The general problem that arises from the use of the existing scales for stroke assessment, from which some are excellent and have demonstrated applicability and practical value, is the fragmentary approach when using some of them and difficulties are necessarily associated with compatibility between different tools. Another problem is the need of creation of a common language and a common information space for the national and international purposes.

ICF AND STROKE PATIENTS ASSESSMENT

International Classification of Functioning, Disability and Health is a relatively new tool, developed by the WHO for assessment of the level of health of an individuum. It provides a multi-dimensional framework for health and disability suited to the evaluation of stroke outcome. ICF aims to provide a conceptual basis and a universal common language for understanding and describing patients health status, reaching beyond mortality, diseases and medical diagnoses. As it belongs to the family of international classifications, it provides a valuable tool to describe and compare the health of populations in an international context (5). The ICF has been already applied in physical therapy and rehabilitation, especially in the field of neurorehabiliotation, to facilitate multidisciplinary team communication, to structure the rehabilitation process, for goal setting and assessment, for documentation and for reporting (6).

According to the ICF framework outcomes may be measured at three levels: body functions/structures, activities and participation. Equal importance is given also to the environmental factors, which reflects the complex nature of disability for an individual. As rehabilitation can be defined as a reiterative problem solving and educational process that focuses on disability (altered activities) and aims to maximize participation in society while minimizing the stress on and distress of the patient and family (7), ICF philosophy and structure perfectly suits this approach to the rehabilitation process. Stroke patients experience poor functioning across the mentioned range of outcomes. Impairment in body function/structure includes mobility limitations, impaired mental status and depression. Stroke patients often experience limitations in activities, ranging from dependance in performing basic activities of daily living (ADL) to difficulties in completing social interactions. Furthermore, stroke patients report restricted participation across various life domains. For example, patients experience low levels of health related quality of life (HRQOL) (8).

Several studies have shown the compatibility and applicability of ICF in stroke rehabilitation process. Schepers et al. outline that functional outcome measures and the ICF are concurrently applied in stroke rehabilitation medicine. This simultaneous use necessitates a further understanding of their relationship and compatibility. Using ICF, it is possible to identify and compare the concepts contained in different outcome measures. According to Geyh et al., most of such concepts could be linked to the ICF (9).

Barak and Duncan draw attention to the increased need of the selection of the appropriate outcome measures in stroke and outline that clinical relevance in stroke outcome measures can be optimized by incorporating a framework of health and disability such as ICF (10).

Mayo et al. studied the possible benefits from incorporation of the ICF into an electronic health record to create indicators of function. The study was performed on post-stroke patients and proved that the ICF coding provides enhanced information about specific functional limitations experienced by persons with stroke. This information may assist with provision of services for persons with stroke and help to explain health discrepancies (11).

At the same time, Morielo et al. explored the possibility of using the ICF for creating coded functional status indicators specific for stroke from the stroke impact scale – 16 (SIS-16) and concluded that ICF can capture most items from functional status measures, such as SIS-16. They also stressed that these items can be mapped onto a standard coding framework, illustrating the potential for increased use of ICF (and ICF core sets) in electronic health records and other computerized health information systems (12).

ICF CORE SET FOR STROKE

According to Stucki and associates, the new language of ICF is an exciting landmark event for rehabilitation. However, in their opinion the success of ICF will depend on its compatibility with measures used in rehabilitation and on the improvement of its practicability (13). The use of the original full version of ICF in daily practice was debated because of its complexity and length. This lead to the understanding of the need for identification of relevant ICF categories in patients with some frequent chronic health conditions, including stroke. For practical purpuses and in line with the concept of condition-specific health-status measures, it was considered to link specific conditions or diseases

Table 1: *Stroke assessment scales according to the US Agency for Health Care Policy and Research (3).*

Type	Name and Source	Time	Strengths	Weaknesses
			Global Assessment Scales	
Global disability scale	*Rankin Scale*	5 min.	Good for overall assessment of disability.	Walking is the only explicit assessment criterion. Low sensitivity.
Measures of disability	*Functional Independence Measure (FIM)*	40 min.	Widely used for stroke. Measures mobility, ADL, cognition, functional communication.	"Ceiling" and "floor" effects.
			Activities (of Daily Living) Assessment	
Activities of daily living (ADL)	*Barthel Index*	5-10 min.	Widely used for stroke. Excellent validity and reliability.	Low sensitivity for high-level functioning.
Measures of instrumental ADL	*PGC Instrumental Activities of Daily Living*	5-10 min.	Measures broad base of information necessary for independent living.	Has not been tested in stroke patients.
	Frenchay Activities Index	10-15 min.	Developed specifically for stroke patients; assesses broad array of activities.	Sensitivity and interobserver reliability not tested; sensitivity probably limited.
			Specific Scales for Mental Status and Speech Functions Assessment	
Mental status screening	*Folstein Mini-Mental State Examination*	10 min.	Widely used for screening.	Several functions with summed score. May misclassify patients with aphasia.
	Neurobehavioral Cognition Status Exam (NCSE)	10 min.	Predicts gain in Barthel Index scores. Unrelated to age.	Does not distinguish right from left hemisphere. No reliability studies in stroke. No studies of factorial structure. Correlates with education.
Depression scales	*Beck Depression Inventory (BDI) (BDI)*	10 min	Widely used, easily administered. Norms available. Good with somatic symptoms.	Less useful in elderly and in patients with aphasia or neglect.High rate of false positives. Somatic items may not be due to depression.
	Center for Epidemiologic Studies Depression (CES-D)	< 15 min.	Brief, easily administered, useful in elderly, effective for screening in stroke population.	Not appropriate for aphasic patients.
	Geriatric Depression Scale (GDS)	10 min.	Brief, easy to use with elderly, cognitively impaired, and those with visual or physical problems or low motivation.	High false negative rates in minor depression.
	Hamilton Depression Scale	< 30 min	Observer rated; frequently used in stroke patients.	Multiple differing versions compromise interobserver reliability.
Assessment of speech and language functions	*Boston Diagnostic Aphasia Examination*	1-4 hours	Widely used, comprehensive, good standardization data, sound theoretical rationale.	Time to administer long; half of patients cannot be classified.
	Porch Index of Communicative Ability (PICA)	1/2-2 hours	Widely used, comprehensive, careful test development and standardization.	Time to administer long. Special training required to administer. Inadequate sampling of language other than one word and single sentences.
	Western aphasia Battery	1-4 hours	Widely used, comprehensive.	Time to administer long. "Aphasia quotients" and "taxonomy" of aphasia not well validated.
			Specific Scales for Motor Functions and Mobility Assessment	
Assessment of motor function	*Fugl-Meyer*	30-40 min.	Extensively evaluated measure. Good validity and reliability for assessing sensorimotor function and balance.	Considered too complex and time-consuming by many.
	Motor Assessment Scale	15 min.	Good, brief assessment of movement and physical mobility.	Reliability assessed only in stable patients. Sensitivity not tested.
	Motricity Index	5 min.	Brief assessment of motor function of arm, leg, and trunk.	Sensitivity not tested.
Balance assessment	*Berg Balance Assessment*	10 min.	Simple, well established with stroke patients, sensitive to change.	None observed.
Mobility assessment	*Rivermead Mobility Index*	5 min.	Valid, brief, reliable test of physical mobility.	Sensitivity not tested.
			Quality of Life and Family Assessment	
Family assessment	*Family Assessment Device (FAD)*	30 min.	Widely used in stroke. Computer scoring available. Excellent validity and reliability. Available in multiple languages.	Assessment subjective; sensitivity not tested; "ceiling" and "floor" effects.
Health status/ quality of life measures	*Medical Outcomes Study (MOS) 36-Item Short-Form Health Survey*	10-15 min.	Generic health status scale SF36 is improved version of SF20. Brief, can be self - administered or administered by phone or interview. Widely used in the United States.	Possible "floor" effect in seriously ill patients (especially for physical functioning), suggests it should be supplemented by an ADL scale in stroke patients.
	Sickness Impact Profile (SIP)	20-30 min.	Comprehensive and well-evaluated. Broad range of items reduces "floor" or "ceiling" effects.	Time to administer somewhat long. Evaluates behavior rather than subjective health; needs questions on well-being, happiness, and satisfaction.

to the correspondent relevant ICF categories of functioning (14). Although some authors (for example, McIntyre and Tempest) (15) question this premise and fear that the introduction of specific ICF core sets for specific conditions may push the classification away from the holistic approach back to a medical diseased-centred model, ICF core sets were elaborated for 12 health conditions, including stroke (16). It should also be noted that development of the core set for stroke took place partly in response to disease-specific clinical guidelines, e.g., the Intercollegiate Stroke Working Party guidelines.

Two versions of ICF Core Set for stroke have been developed – a brief and a comprehensive one. Both of them are presented in Table 2 (17). In the initial development, it was felt that the disease-specific core sets would tend to

Table 2: *ICF Core Set for Stroke (17). (ICF code and ICF 2nd level category title; categories in bold belong to the Brief ICF Core Set for Stroke.)*

Categories of component b (Body Functions)	Categories of component s (Body Structures)	Categories of component d (Activities and Participation)	Categories of component e (Environmental Factors)
b110 Consciousness functions	**s110 Structure of brain**	d115 Listening	e110 Products or substances for personal consumption
b114 Orientation functions	s410 Structure of cardiovascular system	d155 Acquiring skills	e115 Products and technology for personal use in daily living
b117 Intellectual functions	s720 Structure of shoulder region	d160 Focusing attention	e120 Products and technology for personal indoor and outdoor mobility and transportation
b126 Temperament and personality functions	s730 Structure of upper extremity	d166 Reading	e125 Products and technology for communication
b130 Energy and drive functions	s750 Structure of lower extremity	d170 Writing	e135 Products and technology for employment
b134 Sleep functions		d172 Calculating	e150 Design, construction and building products and technology of buildings for public use
b140 Attention functions		d175 Solving problems	e155 Design, construction and building products and technology of buildings for private use
b144 Memory functions		d210 Undertaking a single task	e165 Assets
b152 Emotional functions		d220 Undertaking multiple tasks	e210 Physical geography
b156 Perceptual functions		d230 Carrying out daily routine	**e310 Immediate family**
b164 Higher-level cognitive functions		d240 Handling stress and other psychological demands	e315 Extended family
b167 Mental functions of language		d310 Communicating with - receiving - spoken messages	e320 Friends
b172 Calculation functions		d315 Communicating with - receiving - nonverbal messages	e325 Acquaintances, peers, colleagues, neighbours and community members
b176 Mental function of sequencing complex movements		d325 Communicating with - receiving - written messages	e340 Personal care providers and personal assistants
b180 Experience of self and time functions		**d330 Speaking**	e355 Health professionals
b210 Seeing functions		d335 Producing nonverbal messages	e360 Health-related professionals
b215 Functions of structures adjoining the eye		d345 Writing messages	e410 Individual attitudes of immediate family members
b260 Proprioceptive function		d350 Conversation	e420 Individual attitudes of friends
b265 Touch function		d360 Using communication devices and techniques	e425 Individual attitudes of acquaintances, peers, colleagues, neighbours and community members
b270 Sensory functions related to temperature and other stimuli		d410 Changing basic body position	e440 Individual attitudes of personal care providers and personal assistants
b280 Sensation of pain		d415 Maintaining a body position	e450 Individual attitudes of health professionals
b310 Voice functions		d420 Transferring oneself	e455 Individual attitudes of health-related professionals
b320 Articulation functions		d430 Lifting and carrying objects	e460 Societal attitudes
b330 Fluency and rhythm of speech functions		d440 Fine hand use	e515 Architecture and construction services, systems and policies
b410 Heart functions		d445 Hand and arm use	e525 Housing services, systems and policies
b415 Blood vessel functions		**d450 Walking**	e535 Communication services, systems and policies
b420 Blood pressure functions		d455 Moving around	e540 Transportation services, systems and policies
b455 Exercise tolerance functions		d460 Moving around in different locations	e550 Legal services, systems and policies
b510 Ingestion functions		d465 Moving around using equipment	e555 Associations and organizational services, systems and policies
b525 Defecation functions		d470 Using transportation	e570 Social security services, systems and policies
b620 Urination functions		d475 Driving	e575 General social support services, systems and policies
b640 Sexual functions		d510 Washing oneself	e580 Health services, systems and policies
b710 Mobility of joint functions		d520 Caring for body parts	e590 Labour and employment services, systems and policies
b715 Stability of joint functions		**d530 Toileting**	
b730 Muscle power functions		d540 Dressing	
b735 Muscle tone functions		**d550 Eating**	
b740 Muscle endurance functions		d570 Looking after one's health	
b750 Motor reflex functions		d620 Acquisition of goods and services	
b755 Involuntary movement reaction functions		d630 Preparing meals	
b760 Control of voluntary movement functions		d640 Doing housework	
b770 Gait pattern functions		d710 Basic interpersonal interactions	
		d750 Informal social relationships	
		d760 Family relationships	
		d770 Intimate relationships	
		d845 Acquiring, keeping and terminating a job	
		d850 Remunerative employment	
		d855 Non-remunerative employment	
		d860 Basic economic transactions	
		d870 Economic self-sufficiency	
		d910 Community life	
		d920 Recreation and leisure	

focus on domains within body functions and activity and participation. In reality, when the ICF disease-specific core sets were published, consensus agreement had identified that approximately one fifth of core set content belongs to environmental factors. For example, in the core sets for stroke, 25% of concepts listed are environmental factors. This suggests a strategic change in core set development that reflects the complex nature of disability for an individual (15).

ICF AND APHASIA

Simmons-Mackie and Kagan discussed the use of the ICF as organisational framework for approaching management of impairments and consequences of aphasia, which is also caused by stroke. The practical role of ICF in reaching the final goal of maximizing the quality of life of patients with aphasia was studied. They found out that the dinamic interaction of key ICF constructs on life quality facilitates move toward more effective outcomes for people affected by aphasia (18).

CHALLENGES AND BENEFITS OF THE ICF IMPLEMENTATION

The use of ICF within a multidisciplinary team has already been documented as beneficial for clarifying the team roles and facilitating clinical reasoning. Therefore, the introduction of the ICF core sets can further guide multidisciplinary teams and individual practitioners in service delivery. However, some authors have stated that ICF should only be used as an adjunct to rehabilitation terminology as it is unsufficient at present to be used in isolation. For example, Haglund and Henriksson are convinced that the classification can serve as a useful tool for occupational therapists and supports communication between professions, but is not sufficient as a professional language for occupational therapists (19).

There is still a discrepancy in evaluation of the introduction of the ICF as a new framework for assessment of stroke outcomes at the national and international level. But if we are willing to adhere to the ICF model, we thereby accept the challenge that the goal of rehabilitation is life role participation, with functional improvement as an important intermediary step. The ICF model suggests that we intervene at multiple lower levels (e.g., pathology and impairment) in order to improve the higher levels of function and life role participation. The ICF model also suggests that we should measure things at each level. Not only can we then better understand the response to treatment at each level, but we can also begin to understand relationships between levels. With the ICF model putting forward the challenge of restoring life role participation, it becomes important to design and test interventions that result in impairment gains sufficiently robust to be reflected in functional activities and further in life role participation (20).

Hence, taking into consideration that measuring the outcome of health care is a "central component of determing therapeutic effectiveness and, therefore, the provision of evidence-based healthcare" (21) and that our understanding of the effectiveness of a given rehabilitation intervention is, in part, determined by our ability to measure the impact of that intervention on an individual's functional ability and health, (22) the posibility of using a common, comprehensible, multidimensional and internationally recognized tool that above all would allow professionals in different parts of the world speak the same professional language should not be underestimated.

CONCLUSIONS

A number of generic and specific tools for stroke assessment exist. Different scales and approaches are used in different ways for measuring stroke outcomes. Among them, ICF may represent one of the most integrative and comprehensive instruments in the future. The implementation of ICF would also be a step forward in creation of a common language for health professionals, researchers and policy makers who deal with stroke patients all over the world. However, presently, the problem of quantification and precise measurement of difficulties experienced by the patient using the generic scale is still not resolved and further research and testing in different clinical and rehabilitation contexts are needed to improve its use and make possible its application more wide.

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