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Psychosocial and physical factors predicting handicap following stroke

Key Messages

1. This study has found that psychosocial and physical factors have an impact on the level of post-stroke handicap, thereby providing direction for secondary health promotion by health professionals in both hospital and community settings.
2. It is essential to offer psychological support, implement measures to improve self-esteem, and maximise social support, especially for those without a partner.
3. Interventions should target risk factors for handicap and depression.

Introduction

Stroke, the fourth most common cause of death in Hong Kong, also leads to severe functional limitations in older Chinese people. Having a stroke has a devastating impact on daily life including the physical, psychological, and social aspects. The main outcome measured by this study is handicap. Handicap is defined as the level of participation in society that is possible when there is disability resulting from a health condition, based on the 2001 revised version of the World Health Organization International Classification of Functioning, Disability and Health,[1] which focuses on health and functioning, emphasising a person's functioning in society and in day-to-day life. The measurement of handicap provides information about participation restrictions and the level of hindrance to participation and also provides a more subjective view of recovery.[2]

There are a number of psychosocial factors of concern in the longer-term outcomes of handicap or participation after strokes that include depression, self-esteem, and social support. The prevalence of major depression after stroke ranges from 6 to 37% and the prevalence of depressive symptoms and minor depression ranges from 8 to 63%.[3] Self-esteem has been found to be a significant predictor of physical health and low self-esteem is a symptom of depression as well as a causal or vulnerability factor in reactive depression. Social support can have an impact on a person's rehabilitation from stroke. Social support for stroke patients, whether the support is emotional, informational, instrumental or appraisal, has a positive influence on a stroke patient's functional and psychosocial recovery.

Previous studies have linked functional ability with handicap and depression in stroke patients but measuring physical function alone will not detect all the health status factors important in stroke. It is necessary to measure psychosocial dimensions to achieve a broader assessment of the effects of stroke. Using a biopsychosocial model to describe disability provides a more complete picture of the disabilities experienced by patients following stroke.[1]

The purpose of this study was to gain further knowledge and understanding about the variables influencing the handicap level of stroke survivors in the first post-stroke year in order to guide practice.

Methods

This study was conducted from October 2002 to January 2005. A prospective and longitudinal design was used to collect data from stroke patients from two rehabilitation hospitals on three occasions during the year after their discharge. The inclusion criteria were that patients achieved a score of 18 out of a possible 30 in the Mini-Mental State Examination (MMSE), were Hong Kong residents, did not have co-morbid psychiatric illnesses, and could communicate in and understand Cantonese. All the participants were interviewed immediately prior to discharge; the second phase of data collection was done 6 months post-discharge and the third phase at 1 year.

Functional ability was measured using the modified Barthel Index. The level of participation in society was measured by the London Handicap Scale (LHS). The Geriatric Depression Scale was used to measure depression. State self-esteem was measured using the State Self-esteem Scale. The Social Support

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Table. Frequency and frequency distributions of demographic and disease-specific information at 12 months following discharge (n=188)

Variable	f (f%)
Sex	
Male	116 (62)
Female	72 (38)
Educational level	
Less than primary	69 (37)
Primary	71 (38)
Secondary	44 (23)
Tertiary	4 (2)
Marital status	
Single	5 (3)
Married	132 (70)
Divorced/separated	11 (6)
Widowed	40 (21)
Religion	
No	60 (32)
Yes	128 (68)
Types of stroke	
Ischaemic stroke	149 (79)
Haemorrhagic stroke	28 (15)
Non-specific	11 (6)
Major presentation characteristics	
Left hemiparesis	101 (54)
Right hemiparesis	71 (38)
Non-specific	16 (9)
History of stroke	
No	128 (68)
Once	50 (27)
Twice or more	10 (5)
Recurrent stroke after recruitment	
Yes	7 (4)
No	181 (96)
Discharge location	
Home	158 (84)
Old-age home	30 (16)
Current living arrangement	
Home	156 (83)
Old-age home	32 (17)

Questionnaire was used to determine the number of support persons each patient had and their satisfaction with the support provided. Socio-demographic and disease-specific data were also collected. The MMSE was used to determine the cognitive state.

Results

Sample characteristics
The final sample consisted of 188 stroke survivors who had complete data for all time periods (Table). The age ranged from 45 to 91 (mean, 71.7; standard deviation, 10.2) years.

Changes in psychosocial and physical functional status over time
A repeated measures variance analysis of the LHS revealed significant decreases in overall levels of handicap and depression from baseline to 1 year. There was a significant increase in the level of self-esteem between baseline and 1 year but there were no significant changes in the levels of self-esteem and depression from baseline to 6 months. No significant late changes in both depression and handicap scores were found (between 6 and 12 months). There were no significant differences between the two time periods in social support satisfaction.

Associations between physical, psychosocial, demographic, and disease-specific variables
Significant correlations were found between handicap, functional ability, depression, self-esteem, and social support satisfaction in each time period. Those who lived in old-age homes had significantly lower physical functional status and a higher level of handicap. They had lower state self-esteem and were more depressed. There were no significant differences with regard to social support satisfaction. Those who lived in old-age homes were more likely to have mild-to-severe depressive symptoms than those living at home (45% vs 28.2%). No association between the location of the brain lesion left by the stroke and post-stroke depression was found. There was also no association between the types of stroke and post-stroke depressive symptoms.

A linear regression analysis was performed to investigate whether the measurements made at the 12-month follow-up would predict handicap at 12 months. The results indicated that functional ability, depression, state self-esteem, age, gender, marital status, and place of residence significantly accounted for 72% of the variance in handicap at the 1-year follow-up. Low levels of state self-esteem and functional ability were related to higher levels of handicap. A high level of depression was related to a higher level of handicap. Being female, older, widowed, staying in an old-age home were all associated with higher levels of handicap.

Predicting handicap at 12 months using the baseline and 6 months information
A linear regression model was fitted to predict the level of handicap at 12 months, using the baseline information found to correlate with handicap. The results showed that baseline functional ability, baseline social support satisfaction, age, discharge location and number of strokes significantly predicted 1-year handicap scores; the model accounted for 35% of the variance. Low levels of functional ability and social support satisfaction at baseline were related to higher level of handicap at 1 year. Discharge to an old-age home was related to a higher level of handicap and older age; having an increased number of strokes was also related to a higher level of handicap.

Another regression model for predicting handicap at 12 months used both the baseline and the difference between baseline and 6-month measures of the independent variables. The difference between the baseline and 6 months measures of depression and functional ability, baseline functional ability, depression, age, female sex, and discharge location significantly predicted 1-year handicap scores, accounting for 48% of variance.

Discussion

The longitudinal assessment of the physical and

psychosocial changes experienced by stroke patients over time found significant changes in functional ability, handicap, depression, and state self-esteem. The mean level of functional ability at baseline indicated that the majority of participants had moderate disability before discharge from rehabilitation hospitals. The participants improved in functional ability following rehabilitation. A significant proportion of stroke survivors reported moderate-to-severe disadvantage in each of the LHS domains. Improvement in the mean level of handicap occurred within the first 6 months following the rehabilitation programme. This was similar to the pattern of change in functional ability.

A significant proportion of patients felt at least mildly depressed at 1-year post-stroke. While there was a significant improvement in the level of depression over the first year, there was no significant improvement at 6 months, indicating that depression was not just a reactive adaptation during the acute phase of the disease. The changes in level of self-esteem over time were similar to those for depression: absence of any improvement in self-esteem from baseline to 6 months although significant improvement was found from baseline to 1 year. The absence of significant changes over time in the level of social support satisfaction confirmed the stability of this variable as reported previously and indicated that it should be seen as a moderating variable rather than an outcome for stroke survivors.

There were significant associations between handicap, physical, and psychosocial outcomes as well as socio-demographic characteristics measured at 1-year post-stroke. The findings indicated the importance of assessing these variables at an early stage. Identification of those stroke survivors at risk of high levels of handicap, depression, and low self-esteem will assist health professionals to devise appropriate rehabilitation interventions that target improving both physical and psychosocial functioning. The assessment of the influence of social support on handicap indicated that functional rehabilitation and interventions to enhance social support are needed to enable stroke survivors to participate in society.

In this study, those who lived in old-age homes had significantly higher levels of handicap, lower state self-esteem, and were more depressed. This highlights major challenges for health care professionals who care for stroke survivors in old-age homes. Further studies investigating the associations between environmental barriers, psychological morbidity, and handicap in Chinese stroke survivors are needed.

Implications

This study has found that measures enabling stroke survivors to increase their participation in work and leisure should be a major goal of stroke rehabilitation. The place of residence was found to be a constant predictor of handicap, suggesting that additional attention to institutional settings is warranted. Measures to enable a barrier-free physical environment in old-age homes and increase leisure activities remain a top priority for service provision that should aim to provide opportunities for stroke survivors to resume or to maximise their social life.

This study has also demonstrated that there is a need to attend to psychosocial outcomes including depression and self-esteem, which are more difficult to manage. Health professionals working with stroke survivors should be more sensitive to their emotional needs and should try to explore ways to minimise these negative psychological consequences. While some predictors of the level of handicap, such as age and number of strokes, are not amenable to change, they indicate risk factors that should be factored into the intervention planning.

Acknowledgement

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