EVIDENCE BASED PUBLIC HEALTH POLICY AND PRACTICE

Self ratings of health predict functional outcome and recurrence free survival after stroke

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Study objective: To measure stroke victims' self rated health (SRH) status and SRH transition, and to compare how the two are prospectively associated with disability and recurrence free survival.
Design: Prospective case registry study with face to face follow up interviews at three months, one, two, and three years. Ascertained were SRH status and SRH transition using single question assessments, Barthel Index (BI), Frenchay Activities Index (FAI), and Mini Mental State Examination (MMSE).
Setting: A multiethnic inner city population of 234 533.
Participants: Patients surviving the initial three months after a first in a lifetime stroke in 1995 to 1998.
Results: Of 690 stroke survivors 561 (81.3%) could complete the self report items. Answers to the item on SRH status did not vary significantly between the four follow up interviews. However, responses to the item on SRH transition changed significantly during follow up with three months ratings being more negative than all subsequent ratings. SRH transition, but not SRH status, showed a prospective association with long term outcome in multivariate analyses controlling for the BI, FAI, and MMSE. Compared with all other patients, patients reporting ''Much worse health'' at three months were more likely to be disabled (=BI<20) at one year (OR 6.29, 95% CI 2.26 to 17.52) and their combined risk of stroke recurrence and death was increased over five years (HR 1.72, 95% CI 1.25 to 2.38).
Conclusions: Items on SRH should be used with caution in populations with high rates of disability and language problems, as many participants are unable to complete them. SRH transition may be a better predictor of disability and recurrence free survival after major medical events than SRH status.

S elf rated health (SRH) is a widely used measure of global health in epidemiological studies, as it provides direct information on the person's health perceptions, is easily obtained, and prospectively associated with health care service use and mortality.[1–4] New studies have been demanded that examine SRH in special populations, permit comparisons between ethnic groups, and relate it to other outcome measures such as recurrence of disease and disability.[4]

Although stroke is the disease with largest impact on SRH in individual patients,[5] this indicator has not been examined in a cohort of stroke patients to date. Rates of recurrences and disability are high in the stroke population.[6 7] Therefore, this patient group is ideal to study the relation between SRH and other important outcome measures.

Previous research in stroke medicine has predominantly focused on functional outcome using measures such as the Barthel Index (BI) and the Frenchay Activities Index (FAI).[6 7] Other authors have emphasised the need for more global measures, which take the health related quality of life and the patients' own perceptions into account.[7 8] Items on SRH may provide some basic information in this regard. Furthermore, few data exist on the long term outcome after stroke as most of the publications report on follow up periods of up to one year.[6 9–11]

Most researchers have used items on SRH that investigate the health status (that is, excellent to poor health) at the time of interview and do not take into account the trajectory of health. However, these items have been reported to be comparatively insensitive to major medical events.[12] Items on SRH transition might be a useful supplement as they ask about health changes (that is, much better to much worse health) and therefore tap into the adjustment process to disease and disability. Systematic comparisons between SRH status and SRH transition are lacking.

This population based study compares SRH status and SRH transition in a multiethnic cohort of stroke patients. It investigates how stroke patients rate their health over a follow up period of three years. The prospective association of SRH status and SRH transition with two other outcome measures, disability, and recurrence free survival, is analysed.

METHODS
Case ascertainment
The population based South London Community Stroke Register, established in 1995, prospectively collects data on first in a lifetime strokes in patients of all age groups. The methodology has been described in detail elsewhere and is summarised here.[13 14] Twelve overlapping referral sources are used to attain complete notification of such strokes in the study area. The study area compromises 22 wards of the Lambeth, Southwark and Lewisham Health Authority (LSLHA) with a population of 234 533. Stroke was defined according to the WHO criteria.[15] The diagnosis of stroke and the initial assessment was made by one of the study doctors within the first week after the event where possible. The study includes patients registered between 1995 and 1998. The study was approved by an ethics committee and has conformed to the principles embodied in the Declaration of Helsinki.

Pre-stroke and acute stroke data
Demographic factors analysed in this study include age, sex, and ethnicity. Recording of ethnicity was based on census categories.[13] Patients of African-Caribbean (n = 75) and

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Abbreviations: SRH, self rated health; FAI, Frenchay Acitivities Index; MMSE, Mini Mental state Examination; BI, Barthel Index

Table 1 Comparison between three month stroke survivors that were included and three month stroke survivors that were excluded in this study

	Patients included (n = 561)	Patients excluded (n = 207)	p Value
Age, years (SD)	69.4 (13.7)	71.5 (13.4)	0.06*
Male sex, n (%)	297 (52.9)	100 (48.3)	0.25†
African/Caribbean origin, n (%)	102 (18.2)	34 (16.4)	0.57†
Haemorrhagic stroke, n (%)	88 (15.7)	31 (15.0)	0.81†
Glasgow coma score ⩽13, n (%)	69 (12.3)	57 (27.5)	<0.01†
Dysphasia, n (%)	98 (17.5)	81 (39.1)	<0.01†
Barthel Index before stroke ⩽19, n (%)	114 (20.3)	55 (26.6)	0.06†
Frenchay Activities Index before stroke ⩽15, n (%)	85 (15.2)	52 (25.1)	<0.01†

*t test; †χ² test.

African (n = 27) origin were classified as "black", patients of white (n = 437) and other (n = 22) origin as "white or other". The patients' functional status before their stroke was assessed with the BI and FAI, which were completed during the initial assessment. When the patient was not able to cooperate, proxies were interviewed.[6][16] The BI is a widely adopted instrument to ascertain disabilities in basic activities of daily living such as having a bath and feeding, whereas the FAI is a measure of instrumental activities of daily living at and outside the home and of social functioning. Patients with a BI ⩽19 were classified as "disabled" and with a FAI ⩽15 as "inactive".[17][18] Subtype of stroke was classified as in the Oxford Community Stroke Project and divided into "cerebral infarction/unclassified stroke" and "intracerebral haemorrhage/subarachnoidal haemorrhage".[19] Stroke severity was assessed by the lowest documented Glasgow Coma Score and patients were dichotomised into scores of ⩽13 or higher.[20]

Follow up data
The South London Community Stroke Register undertakes follow up interviews with the patients three months, one year, and three years after stroke. A follow up at two years was made only with the initial 1995 cohort. Hence, for this study data on all of the four follow ups were available for the 1995 cohort; three months and one year data could be included for the 1996 and 1997 cohort; and three months data for the 1998 cohort.

SRH was obtained at each follow up. SRH status was assessed by the following question. "In general, would you say your health is: excellent–very good–good–fair–poor." SRH transition was measured with the following question.

"Compared to one year ago, how would you rate your health in general now? Much better–somewhat better–about the same–somewhat worse–much worse." At one year follow up patients were asked to make a comparison of their health to before the stroke. At three months follow up cognitive function was assessed by the Mini Mental State Examination (MMSE—cut off at 24 points).

Death was notified to the register from the Office for National Statistics (ONS). Registration of stroke recurrence was performed in the same way as for the index stroke. The definition of stroke recurrence was the same as for first stroke with additional criteria[21]: there had to be either a new neurological deficit or a deterioration of the previous deficit not considered to be attributable to oedema, haemorrhagic transformation, or intercurrent illness. Only recurrences 21 days after the index stroke or, if earlier, clearly in another vascular territory were included.

Statistics
Changes in SRH status and SRH transition during follow up were analysed with the Wilcoxon matched pairs signed ranks test and all subsequent self ratings were compared with those given at three months. Cross sectional univariate associations of patient characteristics with SRH status and SRH transition were examined by ordered logistic regression. Multivariate analysis of the relation between SRH at three months and disability at one year was done by logistic regression. At first a model for the control variables was fitted including demographic details (age, sex, ethnicity) and the pre-stroke BI and FAI. In the next step either SRH status or SRH

Table 2 Self rated health status and self rated health transition among stroke patients up to three years after the event, n (%)

	Three months				One year	Two years	Three years
	Full sample	Subsamples for matched pairs tests					
	(n = 561)	(n = 356)	(n = 97)	(n = 86)	(n = 356)	(n = 97)	(n = 86)
Self rated health status							
Excellent	27 (4.8)	14 (3.9)	3 (3.1)	3 (3.5)	21 (5.9)	6 (6.2)	5 (5.8)
Very good	104 (18.5)	67 (18.8)	21 (21.6)	19 (22.1)	53 (14.9)	10 (10.3)	15 (17.4)
Good	198 (35.3)	128 (36.0)	34 (35.1)	31 (36.0)	140 (39.3)	36 (37.1)	31 (36.0)
Fair	149 (26.6)	99 (27.8)	26 (26.8)	23 (26.7)	89 (25.0)	28 (28.9)	26 (30.2)
Poor	83 (14.8)	48 (13.5)	13 (13.4)	10 (11.6)	53 (14.9)	17 (17.5)	9 (10.5)
p* (versus three months)					0.90	0.11	1.00
Self rated health transition							
Much better	16 (2.9)	14 (3.9)	7 (7.2)	8 (9.3)	43 (12.1)	4 (4.1)	4 (4.7)
Somewhat better	47 (8.4)	28 (7.9)	6 (6.2)	5 (5.8)	103 (28.9)	28 (28.9)	18 (20.9)
About the same	183 (32.6)	122 (34.3)	27 (27.8)	27 (31.4)	114 (32.0)	51 (52.6)	44 (51.2)
Somewhat worse	197 (35.1)	129 (36.2)	39 (40.2)	29 (33.7)	68 (19.1)	9 (9.3)	17 (19.8)
Much worse	118 (21.0)	63 (17.7)	18 (18.6)	17 (19.8)	28 (7.9)	5 (5.2)	3 (3.5)
p* (versus three months)					<0.01	<0.01	<0.01

*Wilcoxon matched pairs signed ranks test. The three months data of those who also participated in the one, two, and three year interview are given separately.

Table 3 Univariate cross sectional association between patient characteristics and self rated health status three months after stroke, number (%)

| | Number | Self rated health status three months after stroke | | | | | |
	561	Excellent	Very good	Good	Fair	Poor	p*
Age							0.03
≤75 years	340	14 (4.1)	55 (16.2)	120 (35.3)	97 (28.5)	54 (15.9)	
>75 years	221	13 (5.9)	49 (22.2)	78 (35.3)	52 (23.5)	29 (13.1)	
Sex							0.15
Male	297	13 (4.4)	60 (20.2)	109 (36.7)	78 (26.3)	37 (12.5)	
Female	264	14 (5.3)	44 (16.7)	89 (33.7)	71 (26.9)	46 (17.4)	
Ethnic group							0.01
White/other	459	25 (5.4)	90 (19.6)	162 (35.3)	121 (26.4)	61 (13.3)	
Black	102	2 (2.0)	14 (13.7)	36 (35.3)	28 (27.5)	22 (21.6)	
Stroke subtype							0.96
Infarction	473	22 (4.7)	92 (19.5)	163 (34.5)	123 (26.0)	73 (15.4)	
Haemorrhage	88	5 (5.7)	12 (13.6)	35 (39.8)	26 (29.5)	10 (11.4)	
Glasgow Coma Score							0.85
14 to 15	492	23 (4.7)	88 (17.9)	180 (36.6)	128 (26.0)	73 (14.8)	
≤13	69	4 (5.8)	16 (23.2)	18 (26.1)	21 (30.4)	10 (14.5)	
Barthel Index before stroke							<0.01
Not disabled (=20)	447	24 (5.4)	85 (19.0)	174 (38.9)	114 (25.5)	50 (11.2)	
Disabled (≤19)	114	3 (2.6)	19 (16.7)	24 (21.1)	35 (30.7)	33 (28.9)	
Barthel Index at three months							<0.01
Not disabled (=20)	238	14 (5.9)	61 (25.6)	94 (39.5)	53 (22.3)	16 (6.7)	
Disabled (≤19)	323	13 (4.0)	43 (13.3)	104 (32.2)	96 (29.7)	67 (20.7)	
Frenchay Activities Index before stroke							<0.01
Active (0–15)	476	24 (5.0)	92 (19.3)	179 (37.6)	122 (25.6)	59 (12.4)	
Inactive (16–30)	85	3 (3.5)	12 (14.1)	19 (22.4)	27 (31.8)	24 (28.2)	
Frenchay Activities Index at three months							<0.01
Active (0–15)	233	17 (7.3)	54 (23.2)	94 (40.3)	50 (21.5)	18 (7.7)	
Inactive (16–30)	328	10 (3.0)	50 (15.2)	104 (31.7)	99 (30.2)	65 (19.8)	
Mini Mental State examination at three months							<0.01
≥24	329	19 (5.8)	71 (21.6)	125 (38.0)	83 (25.2)	31 (9.4)	
<24	232	8 (3.5)	33 (14.2)	73 (31.5)	66 (28.5)	52 (22.4)	

*Ordered logistic regression.

transition was added to the model. Finally, the three months BI, FAI, and MMSE were added. For analysis of recurrence free survival Cox regression analysis was used and the same modelling steps as in the logistic regression analysis were used.

RESULTS
Sample description
The number of patients registered on the South London Community Stroke Register between the 1 January 1995 and end of 1998 was 1147, of whom 768 (67%) survived the first three months after stroke. Among the survivors 690 (89.8%) underwent the three months follow up, 78 (10.2%) stroke patients refused to participate or could not be traced. At three months follow up 129 (18.7%) participants were unable to complete self report items because of severe illness, aphasia, or limited command of English and only basic information could be obtained from informants. Hence, a total of 561 stroke patients were available for the analysis of the three months data. Response rates to self report items at one, two, and three years after index stroke were 356 (81.7%), 97 (79.5%), and 86 (81.9%) respectively among eligible participants.

Table 1 permits a comparison between the 561 patients included in the present analysis and those patients who, despite having survived the first three months, could not be included. The second group tended to have a lower pre-stroke level of functioning, more severe strokes, and more often suffered with dysphasia than the first group.

Self rated health in stroke patients over a three year period
Table 2 gives SRH status and SRH transition over a three year period after stroke. The longitudinal comparisons were based on matched pairs tests. The three months data are given separately for those patients who also completed the one, two, and three year follow up and therefore were included in matched pairs tests. There was no significant change in the patients' SRH status during follow up. SRH transition, however, varied significantly over time. Patients tended to report more unfavourable health transitions at three months compared with any of the later annual follow ups.

Cross sectional associations of self rated health
The univariate associations between patient characteristics and SRH status at three months are shown in table 3. Age over 75 years, white/other ethnicity, absence of pre-stroke disability, and inactivity were related to more favourable SRH status. While the acute stroke parameters (subtype and GCS) showed no association with SRH status, the other objective three months outcome measures (BI, FAI, MMSE) did. Table 4 displays the analogous results for SRH transition, which differed only slightly from those for SRH status.

Prospective univariate associations of self rated health
Among the 356 stroke patients, who participated in the one year follow up, 189 (53.1%) were disabled (BI ≤19). Patients with unfavourable SRH status or SRH transition at three months were significantly more often disabled at one year (table 5). However, the rates of recurrence free survival at one

Table 4 Univariate cross sectional association between patient characteristics and self rated health transition three months after stroke, number (%)

	Number	Self rated health transition three months after stroke					
	561	Much better	Somewhat better	About the same	Somewhat worse	Much worse	p*
Age							0.03
≤75 years	340	10 (2.9)	26 (7.6)	98 (28.8)	129 (37.9)	77 (22.6)	
>75 years	221	6 (2.7)	21 (9.5)	85 (38.5)	68 (30.8)	41 (18.6)	
Sex							0.25
Male	297	9 (3.0)	30 (10.1)	95 (32.0)	105 (35.4)	58 (19.5)	
Female	264	7 (2.7)	17 (6.4)	88 (33.3)	92 (34.8)	60 (22.7)	
Ethnic group							0.03
White/other	459	12 (2.6)	40 (8.7)	160 (34.9)	157 (34.2	90 (19.6)	
Black	102	4 (3.9)	7 (6.9)	23 (22.5)	) 40 (39.3)	28 (27.5)	
Stroke subtype							0.19
Infarction	473	13 (2.7)	37 (7.8)	154 (32.6)	165 (34.9)	104 (22.0)	
Haemorrhage	88	3 (3.4)	10 (11.4)	29 (33.0)	32 (36.4)	14 (15.9)	
Glasgow Coma Score							0.78
14 to 15	492	14 (2.8)	37 (7.5)	161 (32.7)	182 (37.0)	98 (19.9)	
≤13	69	2 (2.9)	10 (14.5)	22 (31.9)	15 (21.7)	20 (29.0)	
Barthel Index before stroke							0.02
Not disabled (=20)	447	14 (3.1)	36 (8.1)	152 (34.0)	165 (36.9)	80 (17.9)	
Disabled (≤19)	114	2 (1.8)	11 (9.6)	31 (27.2)	32 (28.1)	38 (33.3)	
Barthel Index at three months							<0.01
Not disabled (=20)	238	8 (3.4)	23 (9.7)	96 (40.3)	86 (36.1)	25 (10.5)	
Disabled (≤19)	323	8 (2.5)	24 (7.4)	87 (26.9)	111 (34.4)	93 (28.8)	
Frenchay Activities Index before stroke							0.23
Active (0–15)	476	15 (3.2)	37 (7.8)	157 (33.0)	177 (37.2)	90 (18.9)	
Inactive (16–30)	85	1 (1.2)	10 (11.8)	26 (30.6)	20 (23.5)	28 (32.9)	
Frenchay Activities Index at three months							<0.01
Active (0–15)	233	6 (2.6)	24 (10.3)	94 (40.3)	88 (37.8)	21 (9.0)	
Inactive (16–30)	328	10 (3.0)	23 (7.0)	89 (27.1)	109 (33.2)	97 (29.6)	
Mini Mental State examination at three months							<0.01
≤24	329	11 (3.3)	28 (8.5)	116 (35.3)	125 (38.0)	49 (14.9)	
<24	232	5 (2.2)	19 (8.2)	67 (28.9)	72 (31.0)	69 (29.7)	

*Ordered logistic regression.

year showed only a significant association with SRH transition and not with SRH status.

Prospective multivariate associations of self rated health with one year disability and recurrence free survival

All multivariate models controlled for the demographic variables, pre-stroke BI and pre-stroke FAI. ''Poor health'' and ''much worse health'' respectively were contrasted with the remaining categories, as the differences between the remaining categories were minimal as evidenced by similar β coefficients in the regression models.

SRH transition at three months was significantly associated with one year disability even after control for the BI, FAI, and MMSE at three months. However, SRH status was associated with one year disability only as long as other three months variables were excluded from the model.

Table 5 The prospective association of self rated health status and transition three months after stroke with disability and recurrence free survival at one year: univariate analyses, number (%)

	Disability at one year		Recurrence free survival at one year	
	No (n = 167)	Yes (n = 189)	Yes (n = 486)	No (n = 75)
Self rated health status at three months				
Excellent	11 (6.6)	3 (1.6)	21 (4.3)	6 (8.0)
Very good	40 (24.0)	27 (14.3)	91 (18.7)	13 (17.3)
Good	67 (40.1)	61 (32.3)	179 (36.8)	19 (25.3)
Fair	40 (24.0)	59 (31.2)	127 (26.1)	22 (29.3)
Poor	9 (5.4)	39 (20.6)	68 (14.0)	15 (20.0)
p*	<0.001		0.38	
Self rated health transition at three months				
Much better	9 (5.4)	5 (2.6)	16 (3.3)	0 (0.0)
Somewhat better	15 (9.0)	13 (6.9)	39 (8.0)	8 (10.7)
About the same	73 (43.7)	49 (25.9)	166 (34.2)	17 (22.7)
Somewhat worse	58 (34.7)	71 (37.6)	175 (36.0)	22 (29.3)
Much worse	12 (7.2)	51 (27.0)	90 (18.5)	28 (37.3)
p*	<0.001		0.004	

*Ordered logistic regression.

Table 6 The prospective association of self rated health status and transition three months after stroke with disability at one year and recurrence free survival over five years: multivariable analyses*

	Disability at one year			Recurrence free survival over five years		
	Odds ratio	(95% confidence intervals)	p	Hazard ratio	(95% confidence intervals)	p
Self rated health status at three months						
Model 1						
"Poor" versus "Excellent to fair"	3.91	(1.76 to 8.71)	<0.01	1.22	(0.85 to 1.76)	0.27
Model 2						
"Poor" versus "Excellent to fair"	2.38	(0.76 to 7.49)	0.14	1.14	(0.78 to 1.66)	0.51
Self rated health transition at three months						
Model 3						
"Much worse" versus "Much better to somewhat worse"	5.59	(2.74 to 11.42)	<0.01	1.75	(1.29 to 2.38)	<0.01
Model 4						
"Much worse" versus "Much better to somewhat worse"	6.29	(2.26 to 17.52)	<0.01	1.72	(1.24 to 2.38)	<0.01

*All models were adjusted for age, sex, ethnicity, pre-stroke Barthel Index, and pre-stroke Frenchay Activities Index. Models 2 and 4 controlled also for Barthel Index at three months, Frenchay Activities Index at three months, and Mini Mental State Examination at three months.

The analysis of recurrence free survival over five years included only those patients who had already survived the first three months after stroke (table 6). In 1650 person years 212 failure events were observed—that is, 66 stroke recurrences and 146 deaths. SRH status did not relate to recurrence free survival in multivariate analysis. On the other hand SRH transition showed a stronger association (p<0.01) with recurrence free survival than the three months BI, FAI, and MMSE. Kaplan-Meier curves of recurrence-free survival are given in figure 1.

In a sensitivity analysis half of the patients who rated their health at three months as "much worse" were randomly deleted. The association of SRH transition with one year disability and recurrence free survival remained significant in models 3 and 4. When SRH transition was dichotomised at a different level ("much better to about the same" compared with "somewhat worse to much worse") results did not change substantially. The association of SRH transition with one year disability in model 3 and 4 remained highly significant (p<0.01), and the association with recurrence free survival was significant in model 3 (p = 0.05) and borderline significant in model 4 (p = 0.1).

DISCUSSION

This population based study examined prospectively SRH status and SRH transition during recovery from stroke over three years. Items on SRH have been shown to have good reliability, when administered in face to face interviews as in our follow up assessments.[22–24]

The main finding of this study was that single question assessments of SRH transition had good predictive validity. "Much worse" health three months after stroke was significantly associated with one year disability and lower five year recurrence free survival. This was even after controlling for outcome measures across a range of domains such as the Barthel Index, the Frenchay Activities Index, and the Mini Mental State Examination. On the other hand the prospective association of SRH status to disability and recurrence free survival did not reach significance after control for the aforementioned three months measures. It should be acknowledged that the Barthel Index has a severe ceiling effect and is an imperfect measure of disability one year after stroke.[17 18] Furthermore, the dichotomisation of SRH status, and SRH transition was done post hoc resulting in increased error chances. The results suggested that "Much
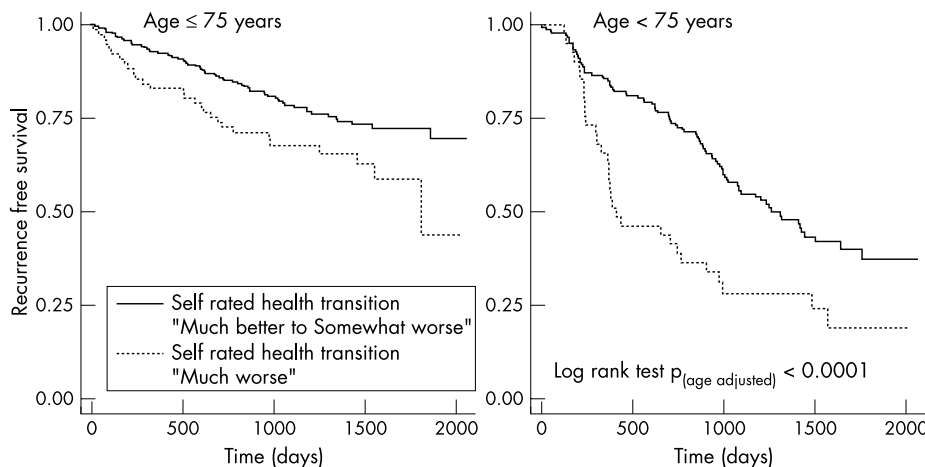

Figure 1 Recurrence free survival over five years after first ever stroke by self rated health transition among 561 stroke patients.

worse'' health three months after stroke in particular was associated with subsequent poor outcome. Differences in outcome between all other self ratings (''Much better'' to ''Somewhat worse'' health) were not substantial.

Studies comparing SRH status and SRH transition are sparse. The only other study conducted in this area corroborates our results as it found SRH decline and not SRH status significantly associated with survival.[25]

This study could assess the sensitivity of SRH to major medical events only indirectly, because no pre-stroke measures of SRH were available. It was assumed that a sensitive item would lead to different responses shortly after the stroke compared with later on. Responses to the item on SRH transition showed a health decline significantly more often three months after stroke than at all subsequent follow ups. The response to the item on SRH status, however, did not change during follow up. These findings are in keeping with one prospective study, which has demonstrated that SRH status remains almost the same before and after medical events such as stroke, myocardial infarction, or hip fracture.[12]

Apparently subjects establish perceptions of their own health status over many years and tend not to revise these perceptions in the wake of a recently experienced acute illness. This tendency might be explained by people's desires to hold positive beliefs about themselves.[26] However, when patients are specifically asked to make a temporal comparison (SRH transition), they realise the decline in health attributable to an illness like stroke and the improvement in health during recovery. This is why items of SRH transition might be more useful indicators of changes in health attributable to an acute illness such as stroke than items of SRH status.

Patients aged over 75 years of age gave more favourable self ratings of both their health status and health transition compared with younger patients. This was in contrast with the observation that elderly patients had higher losses in the Barthel and Frenchay Activities Index after stroke than younger patients.[27] Other researchers have also reported more optimistic health ratings among the elderly population and a decrease in the association between ''objective'' and ''subjective'' health indicators with age.[28 29]

Caribbean and African stroke patients gave less favourable self ratings of their health status and health transition. This could partially be explained by the fact that they were younger and had more disabling strokes than the white patients.[27] The association between ethnicity and both SRH status and SRH transition became insignificant, when it was adjusted for age and the three months BI and FAI (data not shown). Hence, it seems unlikely that there were major differences in the process of evaluating health between ethnic groups.

Although these analysis controlled for cognitive function (MMSE), no adjustment was made for mood. Some authors have argued that depression or low self esteem can affect SRH, whereas others have found SRH to be most closely associated with physical health parameters, rather than with general considerations of morale or self image.[30 31]

One problem in monitoring recovery after stroke is that no instruments are available to measure changes in overall health and quality of life. Longitudinal studies obtaining repeated measures with the same instrument (for example, SF-36, EuroQol), have proved problematic, as measurement errors in some of the subscales can be of the same magnitude as the expected changes.[33] This study demonstrated the advantage of one item asking specifically for a health transition over a general item on health status in the study of recovery from stroke. This may point the direction for the future development of instruments in research on stroke recovery. Instruments should be designed for the cross

Key points

- Self rated health is an indicator that provides valid information after stroke in addition to objective outcome measures such as the Barthel Index.
- Items on self rated health transition may better reflect deterioration and recovery after an acute health event such as stroke than items on self rated health status.
- Patients reporting a health transition to ''much worse'' three months after stroke have an increased risk of disability at one year and decreased chances to survive free of stroke recurrence over the next five years.
- The usefulness of items on self rated health is limited in research on severe and disabling diseases as almost one fifth of patients experience difficulties with completion of these simple single question items.

sectional assessment of health transitions in different dimensions, which might help to avoid costly longitudinal studies.

The representativeness of data from the South London Community Stroke Register is superior to most other studies on stroke outcome. Previous studies have not often been population based,[34] or the case ascertainment has been based on patient self report possibly introducing bias.[8] The proportion of three months survivors who participated in our follow up was high at 90%. However, almost one in five participants could not complete the items requiring patient cooperation. This might be accounted for by the ethnic diversity of the study sample with a high proportion of non-English speakers, as well as the nature of the studied disease that affects brain function. Health ratings by proxies were not used, as significant differences between patients and proxies have been reported.[33] As a result this study could not include a considerable proportion of stroke survivors. This has been an inherent problem with other studies in stroke research, which have tried to measure quality of life and take the patients' own perceptions into account.[23 24]

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