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SPOUSES OF FIRST-EVER STROKE VICTIMS: SENSE OF COHERENCE IN THE FIRST PHASE AFTER STROKE

Gunilla Forsberg-Wärleby,[1,2] Anders Möller[3] and Christian Blomstrand[1]

From the [1]Institution of Clinical Neuroscience, Neurological Diseases Section, Göteborgs University, [2]Department of Occupational Therapy, Sahlgrenska University Hospital, and [3]Institution for Women's and Children's Health, Göteborgs University, Sweden

According to Antonovsky, the individual's sense of coherence is assumed to be crucial in coping with stressful life events. The purpose of this study was to investigate the associations between the sense of coherence of the spouses of stroke victims, the objective severity of the stroke and the spouses' perception of life satisfaction, psychological well-being and cognitive image of life in the future in the first phase after stroke. Eighty-three consecutively enrolled spouses to first-ever stroke victims <75 years participated. Multiple correlations were done to study the association between Antonovsky's 29-item Sense of Coherence scale and the objective impairments of the stroke victim, the Life Satisfaction Checklist, the "view of the future" and the Psychological General Well-being Index. The sense of coherence was significantly associated with satisfaction with life as a whole before stroke ($p < 0.001$), partnership ($p = 0.002$), sexual life ($p = 0.005$), family life ($p < 0.001$) and financial situation ($p = 0.001$). The severity of the impairments of the stroke victims was not significantly associated with the spouses' sense of coherence. However, the sense of coherence was significantly associated with the perception of the future life situation ($p = 0.006$). The sense of coherence was also significantly associated with the perception of positive well-being ($p = 0.007$), self-control ($p = 0.009$), general health ($p = 0.009$) and vitality ($p = 0.002$) at the present, whereas the association with anxiety and depressed mood were not statistical significant. In the experience of a stressful life event such as stroke, satisfaction with general life, close relationships and the socio-economic situation were significantly associated with the spouse's sense of coherence. Spouses with a low sense of coherence were more likely to have low psychological well-being and a more pessimistic view of their life in the future.

Key words: acute stroke, caregivers adaptation, psychological.

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Correspondence address: Gunilla Forsberg-Wärleby, Institution of Clinical Neuroscience, Neurological Diseases Section, Sahlgrenska University Hospital, SE-413 45 Göteborg, Sweden. E-mail: gunilla.forsberg.warleby@neuro.gu.se

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INTRODUCTION

When a life-threatening or disabling disease such as stroke affects a family member it is perceived as a stressful life event (1). The spouses of stroke victims often perceive deterioration in emotional health in both the first phase of stroke (2) and in the long-term perspective (3). In a previous study we showed a strong correlation between the spouses' view of their future life, which also included their perception of their own coping capacity, and their psychological well-being (4). These findings in the first phase after stroke called for further investigation. The "Sense of Coherence" (SOC) is a concept assumed by Antonovsky to be involved in the mediation-process between stressful life events, well-being and health (5, p. 182). The SOC is a personal disposition, a global orientation to life, and is assumed to have its origin in the individual's socio-cultural context from which his/her internal and external General Resistance Resources (GRR) are built up. The GGRs provide him/her with life experience that in turn creates the SOC. The concept consists of three dynamic inter-related sub-components: (a) Comprehensibility (the cognitive component), (b) Manageability (the instrumental component) and (c) Meaningfulness (the motivational component) (6, p. 16). When a person with a strong SOC is confronted with stressors, he/she is assumed to be capable of clarifying and structuring the nature of the stressors, to believe that the appropriate resources are available to cope, to have the ability to mobilize his/her GGRs, to choose what seems to be the most appropriate strategy to cope and to be motivated to deal with the stressor, which he/she regards as a challenge rather than a burden (6, p. 135–148). The role of SOC as a mediator between stressful life events and outcome in terms of well-being and mental health (7), as well as between stressful life conditions and psychosocial adaptation (8), has been investigated in several studies showing that individuals with a high SOC tend to cope more successfully. SOC research has also focused on coping in families that must struggle with disease and disability and has shown that the family SOC predicted family quality of life better than illness severity (9). However, less is known about the significance of caregivers' SOC in coping with neurological diseases. The SOC has been found to be significantly related to adjustment among individuals with paralysis after stroke or spinal cord injuries and their spouses (10). Gallagher et al. showed that the SOC was strongly associated with the adaptation of caregivers of patients with

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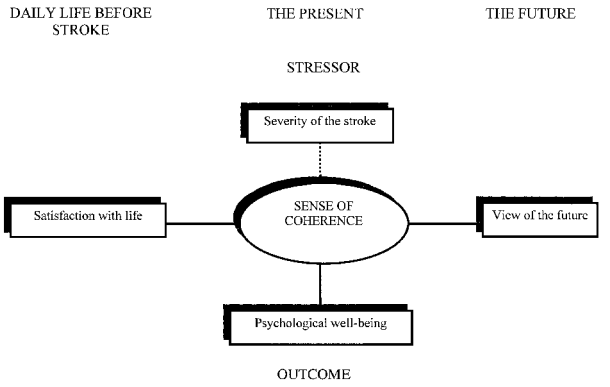

Fig. 1. According to Antonovsky's theory, the General Resistance Resources in the socio-cultural environment gives rise to life experiences that build up the individual's sense of coherence. When facing a stressor, an individual's SOC acts as a mediator between the stressful event and the outcome in terms of well-being. The individual's' SOC is of significance for his/her appraisal of the event. Thus, we assumed that the spouses' satisfaction with life prior to stroke was significantly associated with their SOC and, in turn, the SOC significantly associated with psychological well-being in the present and with the cognitive view of future life. The severity of the stroke was assumed to not be significantly associated with the spouses' SOC in the first phase after stroke.

dementia but did not find a similarly strong association in caregivers of patients without dementia (11).

The studies of the relationship between caregivers' adaptation after neurological impairments and SOC (10, 11) were performed in later phases of the adjustment process. In the first phase of stroke, the spouses are in a stage between the breaking up of the continuity of ordinary daily life and uncertainty about the future. To our knowledge, no study has been done on the significance of SOC in coping with an acute stressor, such as when a close family member is affected by a sudden and disabling illness such as stroke. To better support spouses of stroke victims there is a need for better knowledge of SOC in the first phase after stroke. The aim of the study was thus to investigate the associations between the spouses' SOC and their (a) satisfaction with life prior to the stroke event, (b) psychological well-being after the stroke event, (d) cognitive image of future life and (d) the objective severity of the stroke The main construct and the assumed relationships are shown in Fig. 1.

METHOD

Study group

The initial study group consisted of 83 spouses of individuals (a) with a confirmed diagnosis of a first-ever stroke (subarachnoid haemorrhage excluded), (b) with no evidence of co-existing known malignant or other rapidly progressive medical disease, (c) aged less than 75 years, (d) hospitalized at the Department of Neurology, Sahlgrenska University Hospital, Göteborg, (e) living in Göteborg or the surrounding areas, (f) who spoke and understood Swedish. Spouses who had suffered a stroke or had a cognitive impairment themselves were excluded.

The subjects were included consecutively from September 1994 to October 1997. The stroke patient was contacted within 5 days after the stroke for his/her informed consent, after which the spouse was asked to participate. Eight stroke patients were initially too cognitively disabled to give informed consent. In those cases, the spouse and the patient were informed together and the spouse gave consent. Written, informed consent was obtained from all participants.

The inclusion process is described in a previous study (12). The Ethics Committee of the Faculty of Medicine, Göteborg University, Sweden, granted approval of the study.

Instrument

Data about the spouses:

1. Demographic data such as age and sex of the spouse, family members, occupation and length of relationship
2. Self-rating scales:
   (a) *Sense of coherence*: The "Sense of Coherence Scale" (SOC) consists of 29 items measuring the three SOC components of comprehensibility (11 items), manageability (10 items) and meaningfulness (8 items) (6). Each item has a 7-point semantic differential scale with two anchor phrases (for example "never–very often"). Although the items in the three dimensions are visually separable, the SOC scale was developed to measure the SOC as a global concept. Each item is meant to measure the reaction to a specific "dimension" of stressors. The score of each item is added to reach a total score that ranges between 29 and 203 points. (The higher the score, the stronger the sense of coherence.) Previous studies have shown the SOC scale to possess validity and reliability (13). Values among a Swedish urban population sample aged 26 to 70 years are available (14).
   (b) *Psychological well-being*: The sense of subjective well-being during the most recent week was measured by the "Psychological General Well-Being (PGWB) Index" (15). The index includes 22 items that can be summed to form a global overall score or be divided into six dimensions: anxiety, depressed mood, positive well-being, self-control, general health and vitality. Each item has six response options scored on a scale from 1 (most negative option) to 6 (most positive option). The index has shown validity and reliability in previous studies (16). Norm values from a Swedish population are available (17).
   (c) *Life satisfaction*: Satisfaction with life before the onset of stroke was rated by the "Life Satisfaction Checklist" (18). This checklist consists of nine items: Satisfaction with: "life as a whole", "ability to manage self-care", "'leisure situation", "vocational situation", "financial situation", "sexual life", "partnership relations", "family life" and "contacts with friends and acquaintances". Since the study group involved persons who were employed, were homemakers or were retired, the original item "satisfaction with vocational situation" was expanded to read "satisfaction with vocational/occupational situation", which means satisfaction with ordinary daily occupation (personal communication K. S. Fugl-Meyer, 1995). There is a 6-grade scale for each item ranging from 1 ("very dissatisfied") to 6 ("very satisfied"). The checklist is available in a 9-item (LiSat-9) and an 11-item (LiSat-11) version and is frequently used in studies of life satisfaction (19, 20).
3. A semi-structured interview included open questions on experience concerning life before the event, the ongoing life situation and belief in the future and on coping strategies and resources used. The interviews were analysed according to contents and categorised according to the spouses' perceptions of stressors and coping capability in the future. The analysis resulted in the variable "view of the future", described in a previous study (12). The interview took place on average of 10 days after the stroke (range: 3–29 days), most often at the Occupational Therapy Department. The participants rated their SOC, previous life satisfaction and well-being in the course of the interview. The interviews lasted an average of 1 hour and 45 minutes (range: 45 minutes–3 hours).

Data on the stroke patient: The neurological deficits of the stroke victim, such as disturbance of consciousness during the first days after stroke, level of sensorimotor impairment and occurrence of hemianopsia/visual impairment, neglect, other signs of perceptual/spatial impairment, aphasia or apraxia, were recorded by the neurologist on duty at the ward, by the speech therapist and by the neuro-psychologist. The level of

self-care was assessed by the Barthel Index (BI) (21). The BI has been found to be a valid instrument in measuring the ability in self-care in stroke patients (22). The index scores ranged from 0 (total dependence) to 100 (independence). This assessment was made an average of 7 days after the stroke (range: 2–27 days) by occupational therapists experienced in neurological rehabilitation.

Statistic analyses

Owing to the data distribution and the ordered categorical data characteristics of the instrument, the data are described according to the median and interquartile ranges. However, because results of the SOC are given as means and standard deviations in reference studies, we present these data to facilitate comparisons.

Spearman's rank correlation test was used to investigate the associations between the SOC and (a) the previous life situation, (b) the objective severity of the stroke, (c) the cognitive view of future life and (d) the outcome in terms of psychological well-being.

To reduce the risk of Type I errors in multiple correlation analysis, $p < 0.01$ was chosen as the level of significance.

Power analysis was computed to determine that a sample size of 83 had a sufficient power of 80% provided that the correlation coefficient was at least 0.36 (or −0.36), as the level of significance was 0.01.

RESULTS

Of the stroke victims, 62 were men (75%) and 21 women (25%), with an average age of 58 years (range: 23–75 years). The average age of the spouses was 57 years (range: 27–79 years). Forty-seven spouses (57%) were employed on a part or full-time basis. Sixteen (19%) of the couples had responsibility for children. The median length of the relationship was 31 years (range: 2–54 years). Details on the stroke patients and the spouses are given in a previous study (12).

The analysis of the interviews resulted in the variable "view of the future", which consisted of three sub-components: the spouses' (a) perception of the disease and its impact on the future health and ability of the stroke patient, (b) perceptions of changes in daily activities, roles and life circumstances, and (c) perception of their own coping capacity. According to the definition of the concept "view of the future", the participants were classified into four optimism/pessimism categories with regard to their future life with a high level of intra-rater and inter-rater assessment. This concept has been described in a previous study (12). The neurological profiles of the stroke victims were very heterogeneous. The median of the BI was 100 (range 0–100). The mean of the PGWB Index was 88.96 and significantly lower than the norm values. The median of all of the items in the Life Satisfaction Checklist was between 5 and 6 ("satisfied"/"very satisfied"). The results have been described in detail in previous studies (4, 12).

Seventy-six participants completed the SOC questionnaire. Two SOC questionnaires showed internal dropouts in some items, and these were thus excluded. The construct of the SOC questionnaire is complex and requires a good knowledge of the language and an ability to think in an abstract way. Two persons refused to answer the questionnaire. Further, one person was visually impaired, one lacked sufficient knowledge of the Swedish language and one person was too fatigued. To investigate whether these seven persons had an impact on the results, an analysis of "worst and best case scenarios" was made. The missing data were replaced with the lowest score in the study group in one analysis and with the highest score in another analysis. Existing results were not significantly affected by either of the analyses. In other words, the dropouts did not have an impacted on the conclusions of the study.

The median of the SOC score of the subjects was 148 and the interquartile range (Q1–Q3) was 139–159. The total range of the score was 115–195. The mean score was 149.7, the standard deviation 14.4 and the 95% confidence interval ranged between 146.4 and 153.0. There was neither significant difference in the SOC between the sex of the participants, nor between age and the SOC level. The mean of the study group was within the 95% confidence interval of a Swedish norm group even when the differences in the range of ages between the two groups were taken into consideration.

Four analyses of correlations were done to investigate the associations between the SOC and (a) the previous life situation, (b) the objective severity of the stroke, (c) the cognitive view of life in the future and (d) the outcome in terms of psychological well-being. The correlation coefficients and the 95% CI of the correlation coefficients are reported in Table I.

According to Antonovsky's theory, the origins of the SOC lie in an individual's life experience grounded in his/her socio-cultural context. The first analyses thus concerned the association between the SOC and satisfaction with the dimensions in the "Life Satisfaction Checklist" concerning ordinary everyday

Table I. *Correlation coefficients and 95% confidence intervals for the associations between the Sense of Coherence and the Life Satisfaction Checklist, the Barthel Index, the "View of the Future" and the Psychological General Well-Being Index (n = 76)*

	SOC	*p* value	95% Confidence interval (*n* = 76)
Life Satisfaction Checklist:			
Life as a whole	0.50	<0.001	0.31; 0.65
Ability to manage self-care	0.07	0.529	−0.16; 0.29
Leisure situation	0.28	0.016	0.06; 0.48
Vocational/occupational situation	0.10	0.384	−0.13; 0.32
Financial situation	0.38	0.001	0.17; 0.56
Partnership relations	0.35	0.002	0.13; 0.53
Sexual life	0.34	0.005	0.11; 0.54
Family life	0.40	<0.001	0.19; 0.57
Contacts with friends and acquaintances	0.27	0.017	0.05; 0.47
Barthel Index	0.19	0.093	−0.04; 0.40
View of the future	0.32	0.006	0.10; 0.51
PGWB Index:			
Total score	0.34	0.003	0.12; 0.53
Anxiety	0.23	0.043	0.00; 0.43
Depressed mood	0.27	0.018	0.05; 0.47
Positive well-being	0.31	0.007	0.09; 0.50
Self control	0.30	0.009	0.08; 0.49
General health	0.30	0.009	0.08; 0.49
Vitality	0.34	0.002	0.12; 0.53

PGWB: Psychological General Well-Being.
Statistics: Spearman's rank correlation coefficient (r_s).

life before the onset of stroke. The SOC was significantly associated with satisfaction with "life as a whole" ($p < 0.001$), "partnership relations" ($p = 0.002$), "sexual life" ($p = 0.005$), "family life" ($p < 0.001$) and "financial situation" ($p = 0.001$).

The stressors the spouses had to face were the severity of the stroke and disability of the stroke victim. The second analysis, dealing with the association between the spouses' SOC and the occurrence of neurological impairment and self-care ability level of the stroke victim, showed no significant correlations between the SOC and the presence of any neurological impairment or self-care ability, measured with the BI.

The SOC was assumed to act as a mediator between the stressor and the outcome in terms of well-being. Thus, the third analysis concerned the association between the SOC and the spouses' perceived psychological well-being at the present time. The analysis showed significant correlations between the SOC and the PWGB total score ($p = 0.003$) and the PGWB sub-dimensions of "positive well-being" ($p = 0.007$), "self-control" ($p = 0.009$), "general health" ($p = 0.009$) and "vitality" ($p = 0.002$).

The SOC was also assumed to be associated with the spouses' cognitive view of their life in the future. As expected, there was a statistically significant correlation between the "view of the future" and the SOC score ($p = 0.006$). The spouses with a low SOC were more likely to have a pessimistic view of the future.

DISCUSSION

The aim of the study was to investigate the relationship between the spouses' SOC, the objective severity of the disability of the stroke victim and the spouses' subjective satisfaction with life before the stroke, view of the future and psychological well-being when faced with an acute, chaotic life event. The study showed that the spouses' SOC was associated with their satisfaction with life in general, close relationships and the financial situation. The results support Antonovsky's assumption about the socio-cultural context as the origin of the SOC and the assumption that social support and material resources are significant General Resistance Resources for the creation of SOC (5). However, the causality of the correlation could also be the opposite and is in need of further investigation.

We found no significant association between the objective impairment and disability of the stroke victim at the present and the spouses' SOC. However, the spouses' cognitive view of the future, which includes both his/her subjective perception of the partner's future health and ability and the perception of one's own coping capacity, was significantly associated with the SOC.

Antonovsky viewed the SOC as a continuum and assumed that the adult individual's position on the SOC continuum is fairly stable. When a person faces an unfamiliar stressor, the position on the SOC continuum may decline. However, after a period of time when the individual has mobilized his/her GGRs, he/she returns to his/her original position (6, p. 119–121). Although the spouses had recently undergone a stressful event and their psychological well-being had fallen as compared with norms (4), the mean of the SOC was not significantly lower than the mean of a Swedish urban population (14). Longitudinal studies are needed to determine whether the level of SOC is maintained or changed during the adaptation process when spouses must deal with the challenges of everyday life after stroke.

No significant association with age was seen in this study, which may depend on the small sample size. The relationship between the SOC and age is still unclear. In one population study, younger persons showed a lower SOC than older persons (23), another study reported the reverse (24). However, different assessment techniques were used in these two studies.

Antonovsky also assumed that the SOC is related to health (5, p. 160). Several studies have shown the SOC to be associated with such emotional disorders as depression (25) and anxiety (25, 26). It has been assumed that the SOC can be a reversed measurement of anxiety (26) or negative affectivity (27). In contrast to previous studies, the results of the present study showed a low association between the SOC and anxiety and depressed mood. This may be because previous studies have often investigated anxiety as a trait (26), and depression as a perception of mood in a stable life situation (25). The present study measures the emotions as states during the ongoing event. Longitudinal studies are needed to investigate whether the association between SOC and anxiety or depressed mood becomes stronger when emotions last over a longer period of time. As the SOC questionnaire has not to our knowledge been used as a measurement in the acute phase of a stressor, the validity and reliability of the instrument in measuring SOC in this situation must be investigated in future studies. However, in agreement with previous studies (23, 28), the perception of positive well-being, general health and vitality was significantly associated with the SOC. The possibility that the SOC might act as a resistance to stress or that the feeling of positive well-being, general health and vitality might have impact on the level of SOC during a stressful event cannot be investigated in a cross-sectional study.

The concept of "sense of coherence" is defined as a "global sense", and the three components of "meaningfulness", "comprehensibility" and "manageability" are closely interwoven. The questionnaire was constructed to measure the concept as a whole and was used in this way in the present study. However, the questionnaire is constructed such that it is possible to add the scores of the items of the three sub-components. This technique has been used to identify the association between each component and a specific phenomenon (9). Assuming that the SOC of the spouses is of significance for their coping process, it would have been of interest to gain a deeper understanding of the contribution of the different SOC components to the view of the future and to psychological well-being in the first phase after stroke. However, it has not been sufficiently studied whether it is possible to examine each sub-category separately. The psychometric property of the questionnaire has been investigated in several studies by statistical factor analyses, but the results are ambiguous. Antonovsky showed that the three sub-categories

are highly interrelated and argued that the SOC reflects a single, common factor (29), while other studies have shown several factors with various levels of correspondence to the three SOC components (27, 30). However, as Sandell et al. point out, comparisons of factor analysis studies are complicated, as the statistical models are different (30). The properties of the questionnaire are in need of further study.

It should be mentioned as a limitation in this study that it is not representative of an elderly stroke population. The reasons for including only patients below 75 is that there is high co-morbidity in elderly populations and changes in the social network are common. A great number of the stroke victims in the present study were also moderately to mildly affected. However, we planned the study to focus on the experience of spouses in the younger part of the stroke population.

It is concluded in this study that the SOC of the spouses was not significantly lower than the SOC in a Swedish population group, even though it was measured during an ongoing stressful event. Neither did the SOC differ significantly between different ages and sex of the spouses. In the first phase after stroke, the severity of the stroke did not seem to have any impact on the spouses' SOC. The SOC was associated with satisfaction with general life before the onset of stroke, close relationships and the financial situation. The spouses with low SOC were more likely to have a pessimistic view of the future and lower psychological well-being at the present. The SOC seems to be an important part of the spouses' capacity to cope after a critical life event such as stroke. This result may have clinical relevance. To support spouses in their coping process, the staff should help them to increase their sense of meaningfulness, comprehensibility and manageability of the new life situation by giving them an experience of consistency (an understanding of what has happen and why and what the consequences may be), participating in shaping the outcome and of underload/overload balance in everyday life.

Spouses' sense of coherence during the adaptation process will be further investigated in a longitudinal study focusing on the ability of SOC in the acute phase of stroke to predict spouses' long-term coping process, the stability of the concept, the contribution of the three sub-components, factors impacting the concept over time and the relationship between the concept and health.

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