Psychosocial Function and Life Satisfaction After Stroke
M. Åström, MD; K. Asplund, MD; and T. Åström, PhD

Background and Purpose: This prospective study was designed to describe different aspects of psychosocial function after stroke and the development of changes over time. A major aim has been to identify mental, functional, and social factors associated with low life satisfaction late after stroke.

Methods: Social network, functional ability, leisure-time activities, experience of ill health, major depression, and life satisfaction were assessed repeatedly over 3 years in a population-based sample of 50 long-term survivors of stroke (mean age 71.4 years).

Results: Compared with a general elderly population, patients 3 years poststroke had more psychiatric symptoms, lower functional ability, and reduced life satisfaction. Contacts with children were maintained over the 3-year follow-up period, whereas contacts with friends and neighbors declined early after stroke and remained lower than in the general elderly population (p<0.05). When time dependency was analyzed, activities of daily living and somatic/neurological symptoms were found to change little after 3 months, while psychiatric symptoms showed changes later. Between 3 and 12 months poststroke, the prevalence of major depression decreased, leisure-time activities and social contacts were partly resumed, and life satisfaction improved (p<0.01). Once good life satisfaction was restored it was maintained, and poor life satisfaction at 1 year remained poor for the entire 3 years.

Conclusions: It is concluded that major depression early after stroke, functional disability, and an impaired social network interact to reduce life satisfaction for the long-term survivors of stroke. (Stroke 1992;23:527-531)

KEY WORDS • cerebrovascular disorders • depression • stroke outcome

A marked social deterioration often follows a stroke. The important contributions of emotional and cognitive functioning, coping strategies, and social support to well-being late after a stroke have been recognized.1-9 Quality of life (or life satisfaction) seems to be severely reduced as late as 2,10 4,7 and 53 years after the stroke. In these patients, social functioning has previously been described during short-term follow-up10 or in selected groups of patients undergoing active rehabilitation.5 In groups of elderly patients, no comparisons with other old people have been made.

We have described important determinants of life satisfaction before and at 3 months after the stroke in a population-based cohort of stroke patients and compared them with a general elderly population. Even before the stroke, the patients had more health problems, lower functional ability, more passive leisure time, and lower global life satisfaction than the others of similar age. Three months after the stroke, poor life satisfaction was associated with major depression and poor performance of the activities of daily living (ADL).10 In the present study, we have followed long-term survivors after stroke and compared them with a general population of similar age. Over 3 years we repeatedly assessed their social network, functional ability and dependence, physical and social activities, subjective experience of ill health, major depression, and global life satisfaction. A major aim of the study has been to identify mental, functional, and social factors associated with low life satisfaction late after stroke.

Subjects and Methods
A consecutive series of 98 patients admitted acutely to the stroke unit of the Department of Medicine, Umeå University Hospital, were considered for the study. Patients are admitted to the unit directly from the emergency room in a manner that ensures that they are representative of all patients admitted to the hospital for acute stroke within a well-defined population in northern Sweden.11 This hospital is the only one serving this population.

During the 3-year follow-up, 37 patients died. Four patients refused to participate, four were excluded because of recurrent stroke, two were excluded because they were nonassessable (severe aphasia, mental retardation), and one had moved outside the hospital catchment area. The remaining 50 patients were included in the study. The cohort included in the study was somewhat younger than the original sample of 98 stroke patients (71.4±10.8 versus 73.9±10.9 years, mean±SD). As shown in Table 1, the male-to-female distribution, the
proportion of married/cohabitant, and the distribution of stroke diagnoses were similar in the follow-up cohort and the population-based group of stroke patients. The long-term survivors tended to have had fewer previous strokes (difference not significant) and fewer concomitant cardiovascular disorders (difference not significant), and they had significantly less severe symptoms at onset of the stroke than the original series of patients (Table 1).

The data on the general population were derived from two national sample surveys in Sweden. The first, The Survey of Living Conditions (ULF), contained measures of living conditions and health in a sample of 65–84-year-old people. As the reference group in the present study, the 294 subjects from the four northernmost counties of Sweden (where Umeå is located) were selected. The second national sample survey, The Level of Living Survey (LNU), also included a few questions concerning life satisfaction. Mean age of the LNU participants was 70 (range 65–76) years. This survey is smaller than ULF and, therefore, data from the entire national sample of elderly people (n=828) were used. Because there were more men than women in the stroke group (Table 1) but the national samples had equal numbers of both sexes, the reference group data have been weighted (male:female=1.6:1).

Selected questions from ULF and LNU were used to construct a questionnaire on living conditions and life satisfaction (LL questionnaire) that was used in the stroke patients. Interviews on conditions before the stroke were performed 4–5 days after admission to the hospital, and assessments were then done at 3 months, 1 year, 2 years, and 3 years after the stroke. In patients who were not able to cooperate, a close relative or friend replied. All interviews were performed by the same psychiatrist.

Motor deficits and disorientation in the patient group were assessed by a stroke unit physician, and the procedures have been described previously. The agreement between orientation score from two independent observers was 91%. Performance of the ADL was recorded according to Katz et al. Major depression was diagnosed by an experienced psychiatrist according to DSM-III (except for the organic factor criterion).

Informed consent was obtained from all subjects and/or their relatives, and the study was approved by the Ethics Committee of Umeå University.

For comparisons between the national samples and the study group, 95% confidence intervals were calculated. Significant differences between the national samples and the study group are reported as p<0.05; NS denotes p>0.05. For comparisons within the study group, \( \chi^2 \) tests have been used as follows. For 2x2 tables, in which data represent paired comparisons, McNemar’s test was used; otherwise Pearson’s \( \chi^2 \) or, when appropriate, Fischer’s exact test was used. Calculations were made using SYSTAT.

**Results**

Table 2 shows prevalences of self-reported medical problems over the 3-year follow-up period covered with the general elderly population. High blood pressure, heart complaints, and diabetes tended to be more frequent in the patients before the stroke (NS). One year after the stroke and throughout the follow-up period the patients reported significantly higher frequencies of heart complaints and diabetes than the national sample (p<0.05). In this population we have previously demonstrated good agreement between self-reports and the presence of somatic disorders as documented by medical records.

The frequencies of psychiatric symptoms before the stroke did not differ significantly from those in the national sample of the elderly (Table 2). After the stroke there was a significant increase (p<0.05) in the proportion of patients who reported dizziness, general tiredness, sleeping problems, anxiety/nervousness, and sadness. Dizziness remained as frequent at 3 years as at 3 months after the stroke, whereas the other symptoms showed some improvement from 3 months to 1 year after the stroke. Three years after the stroke, the prevalences of dizziness, anxiety/nervousness, and sadness were still significantly higher than before the stroke (p<0.05 by \( \chi^2 \) test) and than in the general population (p<0.05).

A major depressive syndrome was found in 25% of the patients at discharge from the stroke unit; the prevalence decreased significantly up to 1 year (12%, p=0.01 by \( \chi^2 \) test) but thereafter occurred more often, so that at 3 years after the stroke 25% of the long-term survivors were depressed (Figure 1). The presence of sadness has previously been found to correlate closely with major depression; 6% of the general elderly population reported sadness (Table 2). Disorientation was not common. The proportion of patients dependent

<table>
<thead>
<tr>
<th>Variable</th>
<th>Consecutive series</th>
<th>Present study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men:women</td>
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<td>66:34</td>
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<tr>
<td>Married/cohabitant</td>
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<td>54</td>
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<td></td>
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<tr>
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<td>23</td>
<td>12</td>
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<tr>
<td>Myocardial infarction</td>
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<td>10</td>
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<td>18</td>
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<tr>
<td>Heart failure</td>
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<tr>
<td>Diabetes</td>
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<td>Stroke diagnosis</td>
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<td>Transient ischemic attack</td>
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<td>Brain infarction</td>
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<td>82</td>
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<td>Alert</td>
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<td>90</td>
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<tr>
<td>Lowered</td>
<td>28</td>
<td>10*</td>
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<tr>
<td>Extent of hemiparesis at onset</td>
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<td></td>
</tr>
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<td>Slight to subtotal</td>
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<td>64</td>
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<tr>
<td>Total</td>
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<td>0*</td>
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</table>

Values are %.

*tp<0.05 and p<0.01, respectively, different from consecutive series.
TABLE 2. Self-Reported Prevalence of Disorders and Symptoms in National Sample of Elderly People and Long-Term Survivors After Stroke

<table>
<thead>
<tr>
<th>Variable</th>
<th>National sample (n=828)</th>
<th>Stroke patients (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before stroke</td>
<td>After stroke</td>
</tr>
<tr>
<td></td>
<td>3 mo</td>
<td>1 yr</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>25</td>
<td>36</td>
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<tr>
<td>Heart complaints</td>
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<td>28</td>
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<tr>
<td>Diabetes</td>
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<td>16</td>
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<td>Dizziness</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>Tiredness</td>
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<td>38</td>
</tr>
<tr>
<td>Sleeping problems</td>
<td>23</td>
<td>32</td>
</tr>
<tr>
<td>Anxiety</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Sadness</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

Values are %.

*95% confidence interval not overlapping with that of national sample.
†p<0.05 by χ² test compared with before stroke.

on others for their primary ADL was significantly larger at 3 months than before the stroke (p=0.02), with only little change (NS) occurring over the rest of the 3-year follow-up period (Figure 1).

Figure 2 shows ambulation outside the home and secondary (instrumental) ADL. Significantly fewer patients could take a walk alone, did their own cooking, or were cleaning the house before the stroke than in the general elderly population. Three months after the stroke, the proportion of patients who reported intact function had declined significantly for all secondary ADL (p<0.01) and ambulation (p<0.05) items. No significant improvement was observed from 3 months after the stroke.

Twenty-three items of leisure-time activities were assessed. In Figure 2, illustrative examples from four domains (physical activities, indoor activities at home, attendance at religious services, and amusements) are shown. Before the stroke, the same proportion of patients as in the reference population were active in most leisure-time activities. Only for attendance at religious services and sports events, holiday trips, visits to restaurants, and own sports activities was the proportion significantly lower among the patients before the stroke.

FIGURE 1. Prevalence (percent) of major depression, dependence in activities of daily living (ADL), and disorientation in long-term survivors after stroke (n=50). P, prestroke; D, at discharge; A, at 3 months; 1, 2, and 3, at 1, 2, and 3 years of follow-up.

FIGURE 2. Secondary activities of daily living and ambulation outside home (proportion who are able to independently undertake specific tasks) and leisure-time activities (proportion participating in specific activity at least once a quarter) in national sample of elderly (fine line, n=294) and in long-term survivors after stroke (bold line, n=50). P, prestroke; A, at 3 months; 1, 2, and 3, at 1, 2, and 3 years of follow-up; SHOP, shopping; COOK, cooking; CLN, cleaning house; WALK, walking; BUS, boarding bus; REPS, house/car repairs; SEW, sewing/knitting; BOOK, reading books; REL, visiting religious services; TRIP, taking holiday trip.
Before the stroke, the patients did not differ significantly from the general population for a variety of activities such as fishing, taking walks, gardening, do-it-yourself activities, reading books, visiting the library, cinema, and others (data not shown). After the stroke there was a reduction in physical leisure-time activities most marked at 3 months. By 1 year, many patients were again engaged in do-it-yourself activities (like house repairs, sewing/knitting) or taking a holiday trip. After 1 year, the pattern of leisure-time activities remained essentially unchanged. Patients who had not resumed physical activities like gardening and hiking by 3 months did not do so later (data not shown).

As shown in Table 3, the patients had had closer contact with their children before the stroke than the general elderly population. In other aspects, the social network before the stroke was similar to that in the general elderly population. At 3 months after the stroke, the proportion of patients who had contacts with neighbors, friends, and relatives other than a spouse or children was significantly reduced (p<0.05), whereas the ties with children seemed to remain quantitatively unchanged. At the 1-year follow-up, social contacts with friends were partly improved (NS); there was essentially no further change over time, so that 3 years after the stroke fewer patients still had contact with people other than their children (p<0.05).

Global life satisfaction was assessed by completing the following: "We have asked you many questions about various aspects of your living conditions. Overall, do you think life is . . . " and then the three alternatives "good," "fair," and "poor" were presented. The results are shown in Figure 3. Even before the stroke, a somewhat lower proportion of the patient group found life to be good (84% versus 93% in the general elderly population; NS). Stroke involved a very marked reduction in global life satisfaction, being lowest at 3 months after the stroke, when only 32% of the patients reported their life as being good. This proportion increased significantly to 52% at 1 year (p=0.01); thereafter the proportion was essentially unchanged. Six of the 13 patients reporting their life as fair at 1 year had deteriorated to poor life satisfaction at 3 years after the stroke.

All 10 patients (20%) who rated their life satisfaction as poor at 1 year also reported poor life satisfaction through the remainder of the follow-up period. These patients differed from the rest of the stroke group in that they were older, had significantly lower secondary ADL ability and a more passive leisure time, reported general tiredness and anxiety, lived alone, and had fewer contacts with friends and neighbors (p<0.05) than the others. The frequency of clinically significant depression did not differ at 1 year, but early after stroke these patients with low life satisfaction had a significantly higher frequency of major depression than the rest of the stroke group (p=0.01).

Discussion

The long-term outcome in unselected patients surviving a stroke is usually described in terms of survival, neurological deficits, and functional dependency. The present prospective data provide supplementary information on the global situation in a population-based sample of long-term survivors of stroke, as well as information on the development of changes over time. Compared with a general elderly population, at 3 years after a stroke the patients had more psychiatric symptoms, lower functional ability, and a pronounced reduction in life satisfaction. Contacts with close family members were maintained over the 3-year follow-up period, whereas contact with other relatives, friends, and neighbors declined early after stroke and remained lower than in the general elderly population. Decreased socializing outside the home in half of the physically restored long-term stroke survivors has been reported. Other researchers have demonstrated how social support decreases the risk of poor psychosocial adjustment in patients examined 2-24 months after stroke. Viitanen et al found a social integrative handicap in

![Figure 3. Global life satisfaction in national sample of elderly (Gen. pop., n=828) and in long-term survivors after stroke (n=50). P, prestroke; A, at 3 months; 1, 2, and 3, at 1, 2, and 3 years of follow-up.](image-url)
34% of long-term survivors after stroke. Social disintegration was significantly associated with reduction in global life satisfaction. Failure to maintain or reestablish social ties except for those with close family members, as shown by our results, probably is an important determinant of poor life satisfaction late after stroke. Our results concerning the social network agree with and extend those of Bélanger et al., who reported a higher frequency of contacts with children and a lower frequency of contacts with friends at 6 months after a stroke in patients than in a general population. Psychological well-being was associated with the social integration of an individual outside the immediate family.

Examining the changes over time gives further information about these relationships. ADL functions as well as most somatic/neurological symptoms changed little after 3 months while psychiatric symptoms continued to change. Thus, symptoms of anxiety were gradually reduced over time while sleeping problems and the prevalence of major depression decreased significantly during the interval from 3 months to 1 year after the stroke. During this period, social contacts and leisure-time activities were partly resumed and life satisfaction improved. Patients with restored good life satisfaction retained it up to 3 years after the stroke. Almost half of the patients with poor life satisfaction at 3 months had changed for the better by 1 year, whereas poor life satisfaction at 1 year remained poor for the entire 3 years. Stroke victims with permanently reduced life satisfaction were older, felt more tired and anxious, were dependent on others in secondary ADL, had a passive leisure time and fewer social contacts, and early after stroke had a higher frequency of major depression.

Numerous studies, recently summarized, have demonstrated that depressive disorder is a frequent sequela of stroke although information on the nature, etiology, and frequency of the disorder are still equivocal. Feibel and Springer found that depression was significantly correlated with failure to resume social activities after stroke. The importance of early recognition and treatment of poststroke mood disorders has been emphasized. Starkstein and Robinson, in a summary of their findings, claimed that impaired social functioning probably does not cause poststroke depression but that once depression occurs it—together with physical and intellectual impairment—can reduce the patient’s future social functioning. Our data support these findings. Other common psychiatric sequelae after stroke, including anxiety symptoms and tiredness—which may occur independently or coexist with major depression—also constitute mental barriers for resuming social activities early after stroke. The patient’s social network is apparently as good as in the general elderly population before the stroke, but this important resource for well-being deteriorates after a stroke. This may leave the spouse and/or children with an excessive supportive burden. It seems that psychosocial intervention and support early after stroke and throughout the following years are important to prevent a permanent reduction in life satisfaction for stroke victims and their families.

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References
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