Evaluation of Sexual Changes After Stroke

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Background: Sexual difficulties may arise after stroke. This study was aimed at evaluating and quantifying sexual changes 1 year after stroke.

Method: Sixty-eight stroke patients, consecutively admitted to our rehabilitation unit, were enrolled in the study. Sixty-two patients were available for response after 1 year—46 men and 16 women with a mean age of 64 years (SD = 9.2). Time interval between stroke event and admission to rehabilitation unit was 15 days. None of the patients presented with lack of comprehension. Methods of data collection at admission were clinical examination, computed tomographic scan or magnetic resonance imaging, the Cumulative Illness Rating Scale, laboratory data, and data collection on sexual life from patients and, separately, from their partners. After 1 year, they were interviewed again to assess sexual performance; the Center for Epidemiologic Studies-Depression scale, Structured Clinical Interview for DSM-IV, and Functional Independence Measure were also performed. A questionnaire designed for this study was also administered for collecting data on patients' private lives.

Results: Sexual decline was common in the poststroke period. Age ($p = .009$) and disability ($p = .0059$) were significant variables. There was no correlation between sexual decline and gender, nor injured hemisphere. There was also no correlation to marriage duration, education duration, or depression. Evaluation and analysis of the questionnaires revealed, however, that patients' partners played a substantial role in the decline of sexual activity. Many partners experienced fear of relapse, anguish, lack of excitation, or even horror, which withheld them from encouraging sexual activities.

Conclusion: Data from this study demonstrated that sexual decline in the aftermath of stroke is pronounced. Patients suffer from their sexual impairment, but do not conceal that problem. Psychological, rather than medical, aspects account for discontinuity of sexual activity in stroke survivors, and proper counseling is clearly warranted.

(J Clin Psychiatry 2003;64:302–307)

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In the spirit of full disclosure and in compliance with all ACCME Essential Areas and Policies, the faculty for this CME activity were asked to complete a full disclosure statement. The information received is as follows: Drs. Giaquinto, Buzzelli, Di Francesco, and Nolfe have no significant commercial relationships to disclose relative to the presentation.

The authors thank Mrs. Astrid Van Rijn, who revised the English.

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Studies on quality of life in general and on sexual life specifically after stroke are relatively few. Following early studies,[1] there was general agreement that a decline in sexual intercourse occurs after stroke. However, data do not overlap because a variety of definitions of *sexual life* have resulted in a subsequent differentiation in the literature, with articles addressing libido, satisfaction, erection, ejaculation, lubrication, or overt intercourse.[2–17] Moreover, there are still some issues to be elucidated. First of all, there is no agreement on the causes of sexual decline after stroke, since some authors emphasize the importance of the anatomical lesion and others support the hypothesis of psychological and interpersonal factors. Secondly, the interviews were often done either too early or too late after stroke in this patient population. Too early after stroke, the adjustment to the new life is not complete; too late after stroke, patients might recall wrong data on their premorbid behavior.

This study was aimed at evaluating and quantifying sexual changes 1 year after stroke. Our study was based on the following considerations: (1) quantification of the sexual change required, first of all, an interview about premorbid coital frequency 1 month after stroke, in order to avoid false memories; (2) the interviews to the couple were done separately, in order to avoid mutual influence; (3) after 1 year, information on number of sexual intercourses per week, current pharmacologic therapy, and data on sexual life were taken separately again from the couple; (4) depression and functional status were evaluated for each patient at year 1.

METHOD

Sixty-eight patients consecutively admitted to our rehabilitation unit were enrolled. Patients had suffered from

Table 1. Results of a Survey 1 Year After Stroke of Sexual Activity in 62 Stroke Patients and Their Partners[a]

Question	Patients	Partners
Is motor impairment stressful?		
Yes	40	5
No	22	57
Did the physical impairment oblige you to change your preferred sexual position?		
No	6	6
Yes	9	6
No new position would allow us to have sexual intercourse	47	50
Do you find your sexual life satisfactory?		
No, in spite of maintained sexual intercourse	2	0
No, we do not have sexual intercourse	30	36
Yes, sexual intercourse has been replaced by tenderness and sympathy	11	2
Yes, we still have sexual intercourse	19	24
Do you experience frustration in the case of sexual decline?		
Yes, I am very frustrated	21	23
No, sexual life is not important	9	20
The problem does not apply to me	32	19
How much value has a normal sexual life?		
Very high for everybody	19	7
Very high for healthy people	31	20
Low if a person has a disability	12	35
Are you sexually attracted by your partner? (for patient's partner only)		
Yes		7
No		55
How is your erection? (for male patients)		
Normal	9	16
Incomplete	23	10
Absent	30	36
How is your ejaculation? (for male patients; lubrication for female patients)		
Normal	9	14
Precocious	1	2
Late	22	10
Absent	30	36
Comments (not mandatory) _____		

[a]Patients and their partners were asked to indicate just 1 answer.

a first-ever stroke 2 weeks before. Subjects were considered ineligible in cases of lack of sexual activity before stroke due to absence of partner or disease of one member of the couple. Patients suffering from severe aphasia were not included. The Cumulative Illness Rating Scale was used to evaluate comorbidity.[18] After 1 year, 6 of the 68 previously enrolled subjects could not be interviewed due to death (2 cases), lack of consent (1 case), or being lost to follow-up (3 cases). Therefore, the paired comparisons were made on 62 subjects, 46 men and 16 women. Mean age was 64.0 years (SD = 9.2), mean education duration was 5.6 years (SD = 2.5), and mean duration of marriage was 34.9 years (SD = 9.9). Thirty-seven patients (59.7%) had a lesion in the left hemisphere, 23 patients (37.1%) had a lesion in the right hemisphere, and 2 patients (3.2%) had a lesion in the pons. Thirteen patients (20.9%) suffered from language impairment but were able to communicate. No patient had epilepsy.

Patients and their partners were separately interviewed about weekly sexual performance at time of admission to the rehabilitation center. A routine clinical examination, including a computed tomographic scan, was performed for each patient. They were informed of the objective of the study and gave their written consent. After 1 year, patients and partners were invited to return to the center. A structured interview designed for this study addressed the following issues: (1) number of times per week they engaged in sexual intercourse; (2) the time at which sexual activity had started again; and (3) drugs taken by the patient. Moreover, since there is no validated questionnaire, we used our own questions on changes in sexual positions, satisfaction, frustration in case of sexual decline, and the value given to a normal sexual life (Table 1). Again, each member of a couple was interviewed separately.

Data on sexual performance were collected from both couple members and expressed as a weekly mean. The mean frequency was calculated for the last 6 months, a period that is neither too long nor too short.

At the second interview, the presence of depression was investigated by means of the Center for Epidemiologic Studies-Depression scale (CES-D), a 20-item questionnaire to measure depressive mood in the community,[19] followed by the Structured Clinical Interview for DSM-IV (SCID).[20] Disability was evaluated by means of the widely applied Functional Independence Measure (FIM).[21] Descriptive statistics, t test for paired comparisons, correlation coefficient, and multiple regression analysis were done.

The protocol of the study was approved by the local ethics committee. Informed written consent was obtained from all participants.

RESULTS

Sexual activity as reported by patients and their partners at admission and after 1 year is shown in Table 2, as are the correlation coefficients both at baseline and at retest time. The patient-partner agreement was good, although there was a nonsignificant tendency for men to overestimate their performance.

The test-retest variation indicates a pronounced decline in weekly frequency of sexual activity. According to the patients' interviews, 26 men and 4 women completely ceased all sexual activity. However, their partners' interviews revealed that it was 30 men and 6 women. Therefore, about 50% of the patients had no sexual activity. The decline was more evident in women, albeit in a nonsignificant way ($t = 1.109$, $df = 56$, $p = .27$). Likewise, the lesion side was not significant ($t = 1.407$, $df = 54$, $p = .16$). The disability was measured and the percentiles are shown in Table 3. The median FIM value was 85, i.e., independence was regained by the patients at least in part.

Table 2. Baseline and Poststroke Weekly Sexual Performance as Reported by Patients and Partners

Weekly Coital Events	Patients Mean (SD)	Partners Mean (SD)	Patient-Partner Agreement Correlation	Z-value	p Value
Baseline					
Total (N = 68)	1.59 (1.77)	1.25 (1.20)	0.73	7.06	< .0001
Female (N = 20)	1.81 (2.06)	1.71 (1.45)	0.64	2.73	.0063
Male (N = 48)	1.50 (1.67)	1.08 (1.07)	0.85	7.96	< .0001
Poststroke					
Total (N = 62)	0.38 (0.57)	0.18 (0.29)	0.42	3.40	.0007
Female (N = 16)	0.26 (0.33)	0.13 (0.13)	0.61	2.59	.0097
Male (N = 46)	0.42 (0.62)	0.20 (0.33)	0.40	2.71	.0067

Table 3. Functional Independence Measure (FIM) Scores and Center for Epidemiologic Studies-Depression Scale (CES-D) Scores and Percentiles

Percentiles	FIM	CES-D
10	53.7	8
25	60	8
50	85	20
75	97	23
100	120	28.3

A multiple regression analysis was performed. Normalized test-retest variance of weekly sexual performance measured by the number of times they engaged in sexual intercourse per week "WSP," as obtained from the partners, was the dependent variable. Independent variables were age in years "AG," marriage duration in years "MD," education duration in years "ED," baseline sexual performance measured by the number of times they engaged in sexual intercourse per week "BP," depression according to score on the CES-D "CES," and functional independence according to score on the FIM "FIM." The obtained equation was: WSP = 242 – 2.23 AG + 1.17 MD + 0.41 ED – 2.08 BP – 0.23 CES – 0.83 FIM.

Only 2 coefficients had a significant p value: age (p = .009) and FIM score (p = .0059). Interestingly, sexual life before stroke was unpredictive of poststroke sexual activity. However, the R^2 value was low, namely 0.232.

A small percentage of patients (3.2%, N = 2) experienced enhanced sexual activity, as reported by their partners. The pattern was described as exaggerated or deviant. Both patients had a lesion in the right temporal lobe.

The CES-D percentiles for depression are listed in Table 3. One can see that the median value was 20, which was just above the cut-off. The subsequent SCID score indicated that 4 patients suffered from major depression (6.45%).

The answers to our questionnaire gave more results. Eighty-three percent (N = 25) of patients who said that they had regained their sexual activity reported that sexual life had started again between the third and the sixth month after their stroke, practically immediately after time of discharge from the rehabilitation center. Sexual desire unmatched by partner's desire was present in 15 men and in 4 women. Fear of relapse or of physical risk was reported by 25% of male partners (N = 4) and 21% of female partners (N = 10). In 6 cases, changes in sexual position were solicited by female partners who were not keen at all to bear their husbands' weight. The importance of sexual life was stressed by male patients more than by their female partners, who considered the sexual impairment less important than other disability aspects.

With regard to pharmacologic treatment, each patient was treated with an average of 2.5 different medications on a daily basis. Within our patient population, a wide variety of drugs was found. However, pharmacologic treatment of the patients reporting decrease of sexual activity did not differ from that of patients reporting no decrease in sexual activity. A patient who experienced sexual excitation was treated with a combination of nimodipine, phenobarbital, tizanidine, an angiotensin-converting enzyme inhibitor, and ticlopidine. None of these drugs is known to excite sexual desire. Their effect, if any, can be rather depressant.

DISCUSSION

The original objective of this study was the accurate evaluation and quantification of sexual activities based on a double interview at 2 different times, namely, 1 month and 1 year after stroke. Indeed, the main goal of the study was to evaluate the reliability of data, which cannot be taken for granted, when sexual life is studied. In fact, moral barriers, shame, frustration, or cultural inheritance may hinder cooperation. However, the information collected from patients and their partners were consistent in this study, both at baseline and after 1 year.

Patients and their partners were separately interviewed on the same day, in order to avoid mutual influence. They confirmed a sexual decline in the poststroke period. The good patient-partner agreement on poststroke sexual life indicates that patients are generally sincere and do not try to conceal their impairment. The mean decline in the frequency of performance was quite high (83.3%). Lack of erection was reported by more than half of the male patients; 37.5% of male patients overtly complained about the quality of their erection and ejaculation. Appar-

ently, the sexual decline experienced by the patients in our study outscored previous findings.[1,6] We believe the reason is that quantified frequency of sexual activity before and after stroke is more accurate than a simple "Yes" or "No" response, based on the sheer statement of the experienced changes. Two patients (3.2%) reported increased sexual activity, which was confirmed by their partners.

The possibility of a selection bias seems highly unlikely. The Cumulative Illness Rating Scale was used to evaluate health status. Patients who had severe comorbidity (scores of 4 and 5) were not admitted. However, these patients would not have changed the results, because mortality is high in this group, and few patients, if any, could have been interviewed after 1 year. Conversely, patients with good recovery were included, because patients suffering from a first-ever stroke were usually referred to us by neighboring hospitals.

It is important to distinguish the age factor in the issue of poststroke sexual decline. In a previous study carried out in the same area of Italy, of 300 normal subjects (141 women and 159 men aged between 55 and 90 years), only one third of the subjects complained of diminished sexual satisfaction.[22] In our study, sexual decline could not be attributed to age-related decline in sexual functions. A subgroup of 5 patients under 50 years had a mean weekly sexual frequency of 4.6 (SD 1.3) before stroke and 0.4 (SD 0.2) 1 year later. Their relatively young age offsets the importance of the 1-year interval as a cause of sexual decline.

The impact of some variables on sexual activity, like gender and lesion hemisphere, is still unclear in the aftermath of stroke. Gender is a discussed variable. Men and women experience the same changes.[5,8,10,14] Desire did not change with gender, but some women experienced absent cycle[4,6] and men had difficulties,[6,12] such as significant decrease in ability to achieve erection and to ejaculate. All of the women who were premenopausal at the time of stroke reported major alterations in menses.

The frustration about a decline in sexual activity was less if there were preexisting sexual problems.[12] Indeed, male patients complained more than female patients did about the sexual decline,[5] but in our study, gender-linked differences were not significant. However, the probability of finding completely qualified men as subjects after stroke was significantly higher than of finding qualified women, because many women were either widowed or single with no sexual activity prior to stroke.

Some previous data seem to stress the importance of the hemisphere in which the lesion is located. In a retrospective study on 25 patients,[8] a sexual decline was likely when the dominant hemisphere was struck. By contrast, a lesion in the non-dominant hemisphere could yield sexual excitation, and libido was independent of which hemisphere was struck. Women with a right hemisphere lesion had less sexual decline than women with a contralateral lesion, whereas hemisphere was unimportant in men.[10] Other authors consider the right hemisphere important for libido, sexual activation, and function.[2,3,23] When sexual decline was considered, our statistical analysis showed no side prevalence in men or in women. The identification of the affected areas does not support the role of a critical anatomical location. By contrast, sexual excitation in 2 of our male patients could be attributed to temporal lesions on the right side. In 3 cases of hypersexuality reported by other authors, the patients also experienced epileptic seizures.[24] It is still unclear why temporal lesions may lead to sexual excitation in some cases and not in other ones.

A negative impact on sexual activity was observed for disability.[13,15] However, it was already recognized that sexual variations were related to impairment without a typical pattern.[3] In particular, the impairment in superficial sensitivity has been claimed to be of critical importance,[3,13] whereas hormones are considered unimportant.[3,14] Indeed, medical factors are also important, as several diseases can cause impotence regardless of the presence of stroke, but a particular clinical syndrome at the individual level does not account for the entire population.

In our study, age and functional status were the only independent variables with a significant role, which had a negative influence on the variation in sexual intercourse after stroke. However, the variance explained by those variables is low ($R^2 = 0.232$). By contrast, lack of correlation was found for education, length of marriage, and depression. Our data do not support the hypothesis that a high level of premorbid sexual activity is predictive of maintained sexual life.[8,9] By contrast, a long marriage is likely to be followed by a consistent decline in sexual activity. It has been demonstrated that sexual activity and sexual satisfaction decline in women and men as the duration of the partnership increases.[25]

Age and disability are unimportant according to other studies.[9] Responses reveal that the main influences appear to be psychological rather than biological, since age and disability had a low weight in our multiple regression analysis. Therefore, their influence is limited, although statistically significant. Psychological variables are relevant, such as the unsuccessful coping process of the partner. The couple calls for attention to their problems and requires help.[3,17] Fear of relapse plays a role,[12] whereas, according to other studies, clinical factors do not play a crucial role in causing sexual decline and medical treatment is considered of no importance.[17,26] Sexual decline is also explained by psychological and interpersonal factors, as indicated by other studies,[5,17,27] and by the reduced desire of the partner.[14]

It can be surprising not to find depression among significant variables. Indeed, that association has been found.[28] In our data, the CES-D identified cases of major depressive disorder that were later confirmed by the SCID. According to our previous experience, sensitivity

of the CES-D for current major depressive disorder is 100% in stroke patients, while specificity is 35.9%. The scale did not produce false negatives, i.e., none of the subjects with a diagnosis of major depressive disorder scored below the cutoff. By contrast, the quote of false positives was elevated. Indeed, more than two thirds of the subjects with over-threshold CES-D scores did not meet DSM-IV criteria for major depressive disorder.[29] The CES-D was originally designed for epidemiologic survey in the general population, but several studies have proven the psychometric properties of the scale among different target populations. In particular, the questionnaire has shown its usefulness in physically ill populations.[30,31] The percentiles of the CES-D values are listed in Table 3. Only 4 patients among them were found to be affected by major depression (6.4%) and they were taking antidepressant drugs. Moreover, patients suffering from severe aphasia were not included. Therefore, a bias is possible. However, it is unlikely that depressive state alone can account for the sexual decline in stroke patients. It is also possible that depression is a consequence of sexual frustration rather than the cause. Another explanation relies on the observation that emotional disturbances were related to decreased poststroke sexual activity after 2 years,[32] thus a longer time interval than our observation window.

Six patients admitted that their impotence was more frustrating than the motor impairment. In our cases, antidepressant therapy did not solve sexual problems. The results of our study endorse the opinion that psychological issues and interpersonal relationships, rather than medical ones, account for disruption of sexual functioning in stroke survivors, although in absence of overt depression.

Sexual and partnership satisfaction were compromised in men who were dissatisfied with their health and reported somatoform complaints and interpersonal problems.[33]

In conclusion, according to our findings, main problems were: 1) the fear of relapse experienced by both the patient and the partner, 2) the belief that sexual life only belongs to healthy people, and 3) the "turned-off" partner, who complained of lack of excitation or even horror. A high percentage of partners (88.7%) reported in the questionnaire that they were not keen at all to have sexual intercourse with a sick person. Fear of relapse, anguish, lack of excitation, or even horror (partners were deeply embarrassed to face the naked disabled patient) withheld many partners from encouraging sexual activities. In a predominantly male population (95.5%), the patients kept unnecessary limitations on sexual activity 2 to 5 months after myocardial infarction and required proper information about their future sexual functioning.[34] Women can experience a drop in sexual activity even 1 year before myocardial infarction.[35]

It follows from the above considerations that sexual activity should be carefully evaluated in poststroke rehabilitation, and intervention is necessary to offset psychological disturbances, lack of information, and prejudice. Since interpersonal problems are recognized, couples sex counseling is called for. Other authors have also reached the same conclusions.[9,14,26,27]

Treating sexual problems in stroke survivors enters the framework of a holistic approach. Prevention should dispel stereotypes, myths, and misperceptions, not only in stroke survivors and their partners but also in rehabilitation staff members who may be unprepared for this goal.[27] Quality of life, of free time, and of leisure activities drop 1 year after stroke.[36] Counseling stroke survivors for sexual problems is a challenging experience but is a necessity for improving their quality of life.

Drug names: nimodipine (Nimotop), ticlopidine (Ticlid and others), tizanidine (Zanaflex and others).

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents has been presented in this article that is outside U.S. Food and Drug Administration–approved labeling.

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