

ORIGINAL ARTICLE

Sexuality in patients with spinal cord injuries due to attempted suicide

G Lombardi¹, N Mondaini², P Iazzetta³, A Macchiarella¹ and GD Popolo¹

¹Neurourology Section, Spinal Unit, Careggi Hospital, Florence, Italy; ²UO Urology, S Maria Annunziata Hospital, University of Florence, Italy and ³Neuropsychiatric Department, University of Pisa, Italy

Objective: To evaluate the specific characteristics of sexuality in spinal cord injury (SCI) patients resulting from attempted suicide pre- and post-SCI.

Methods: From March 1998 to March 2005, $n=27$ were compared with a SCI group with similar characteristics. In March 2006, all patients completed a final sexual check-up. Using our database we reviewed their sexuality path.

Results: Suicide group (SG): Examination of personal/clinical history revealed in three how sexuality represented a possible co-factor for suicidal tendencies: one female reported a history of sexual abuse, two were homosexual (one gay and one lesbian). Five reported sexual dysfunctions. Nine females consistently showed via the Female Sexual Function Index (FSFI) at least one sexual disorder in all follow-ups; six females were in a stable relationship pre-SCI, seven during the final check-up; eight males in the SG presented erectile dysfunction using the International Index of Erectile Function (IIEF5); and eight were in a stable relationship pre-SCI and seven during the final visit.

Control group (CG): Pre-SCI only one male presented erectile dysfunction. Seven females consistently showed sexual disorders. 11 females and 11 males were in stable relationships pre-SCI, respectively, 10 and 11 at the final check-up. In women the overall sexual satisfaction is statistically significant, correlated to the duration of the relationship $P<0.05$. Nine patients showed erectile dysfunction in the final follow-up.

Conclusions: The SG showed a higher percentage of sexual dysfunction pre-SCI compared with CG, and they presented constant difficulty in establishing a stable relationship causing both an obstacle in the initial sexual rehabilitation and in achieving a satisfactory overall sexual life.

Spinal Cord (2008) **46**, 53–57; doi:10.1038/sj.sc.3102062; published online 10 April 2007

Keywords: spinal cord injury; attempted suicide; mental disorders; sexual dysfunctions; sexuality

Introduction

Suicide is among the top 10 causes of death in every country and, in Europe, the second leading cause of death in those who are 15–35 years old.¹ In a 10-year span during the 1990s, the global proportion of suicide in Italy was 12 in 100 000 males and four in 100 000 females.² In Italy, young people between the ages of 25 and 29 are at the highest risk for suicide, even if the highest percentage of death owing to suicide are people who are 65 or older. Although death caused by infection in spinal cord injury (SCI) has fallen substantially over the past 20 years, the suicide rate has increased over the same period.³ Among people with SCIs, death from suicide is 2–6 times more prevalent than in the general population and about five times more prevalent than

in age–gender–race-matched populations. Although men are more likely to die from a suicide attempt, women attempt suicide about twice as often as men.⁴ Suicide is now understood as a multidimensional disorder, which results from a complex interaction of biological, genetic, psychological, sociological and environmental factors.⁵ Literature reports that gay men and lesbian women are two or three times more likely to attempt suicide than other young people.^{6–7} Many of them feel isolated, and may have difficulties coming to terms with their own sexuality.

Problems arising from society's attitude toward homosexuals may cause mental illnesses such as depression and affective disorders, and many use alcohol and drugs as a means of coping with societal oppression.⁸ Fewer studies, however, have focused on the sexual history of individuals who have sustained SCI as a result of a suicide attempt, even though literature reports sexual impairments in all patients with SCI owing to attempted suicide as the most disturbing problem pre-SCI.⁹

Correspondence: Dr G Lombardi, Neurourology Section, Spinal Unit, Careggi Hospital, Florence, Italy.

E-mail: giuseppelombardi@interfree.it

Received 22 May 2006; revised 25 February 2007; accepted 28 February 2007; published online 10 April 2007

Aim of the study

To evaluate the specific characteristics of sexuality in SCI patients who attempted suicide.

Methods

Participants

From March 1998 to March 2005, 54 patients with SCI were selected for our study. All these patients were hospitalized following their spinal cord lesions and completed their initial rehabilitation in our Centre.

We divided the patients into two groups. The first (suicide group (SG)), composed of 14 males and 13 females, were admitted to the Spinal Unit of Florence with a SCI caused by a suicide attempt. This group was compared with a control group (CG) of equal size, matched age, gender, time since injury, grade and injury level with reference to the American Spinal Injury Association/International Medical Society of Paraplegia (ASIA/IMPSOP).¹⁰ At the time of the spinal cord lesions, the median male age was 33.2 with a range of 21–48 years, and the median female age was 34.5 with a range of 22–51 years; two were in natural menopause for each group before SCI. During initial hospitalization the presence/absence of an actual or lifetime mental disorder was confirmed through a psychiatric interview. Possible psychiatric disorders in both groups were diagnosed according to Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) criterion.¹¹ We excluded patients younger than 18 and patients with any psychiatric conditions in the CG. Using our database, we extracted all possible relevant data regarding the sexuality of these patients from initial recovery to final follow-up performed by March 2006.

Initial recovery

During the initial recovery, we performed a detailed sexual anamnesis for each patient pre-SCI in which we reported possible risk factors for sexuality: medical and lifestyle factors such as drug/alcohol abuse and chronic smoking,^{12,13} presence of sexual dysfunctions and if they had undergone specific diagnostic investigation and/or pharmacological therapies.

Follow-up

In the follow-up, using the database, we researched all relevant data concerning sexuality, such as: presence, type of sexual dysfunctions, therapies for sexual dysfunctions and any information on fertility.

Final follow-up. All subjects in treatments for sexual dysfunctions had agreed to suspend any therapies for sexuality at least 4 weeks before the final visit. To complete the sexual investigation of the final 4 weeks, female and male patients filled out the Female Sexual Function Index (FSFI) and the International Index of Erectile Function (IIEF5), respectively.^{14,15} Moreover, all patients were evaluated on their overall sexual satisfaction: male subjects responded to

questions 13 and 14 of the IIEF (15) questionnaire, whereas the females answered questions 14, 15 and 16 of the FSFI.

The investigators used consensus validation to complete data analysis, and all research findings were reviewed by the study participants for validation. Statistical analysis was considered significant with *P*-value less or equal to 0.05.

Results

Details of injury

The neurological functioning level of the spinal cord is shown in Table 1.

Psychiatric assessment

SG During the initial recovery, personal history showed long-standing mental disorders in 25 out of 27 patients (92.5%). Four subjects, three are male, with mental disorders did not come to the final visit. Two male patients quit using drugs and one resolved her conflict with her partner (see Table 2).

In the CG post-SCI, one woman and one man followed pharmacological treatment for depressive symptoms but they did not fulfil DSM criterion for a mood disorder. These patients were never hospitalized for depression and none attempted suicide.

Pre-SCI sexuality background

SG One female who had been sexually abused showed sexual aversion disorder as body dissatisfaction and self-consciousness resulting in sexual discomfort. One female of fertile age was in secondary amenorrhea. All females with desire impairment and the patient in amenorrhea used

Table 1 Classification of patients with reference to the ASIA/IMPSOP

	A	B	C	D
Cervical lesion	4	2	4	2
Dorsal lesion up to D10	12	2	6	0
Dorsal lesion below D10	12	4	4	2

Abbreviations: ASIA/IMPSOP, American Spinal Injury Association/International Medical Society of Paraplegia.

Table 2 Psychiatric assessment of suicide group

Psychiatric assessment	Patients	
	First visit	Final visit
Major depressive disorder (MDD)	9	7
Schizophrenia	4	3
Bipolar disorder 1 (BP1)	4	4
Bipolar disorder 2 (BP2)	3	3
Substance-related disorders (SUB) (mainly alcohol, heroine and cocaine addiction in one subject)	3	1
Behavioral disorders of children and adolescence	1	1
Situational distress (generally marital or work related)	1	0

All were being treated with psychiatric medications, both before the suicide attempt and throughout the period of the study.

Table 3 Pre-SCI sexuality main data

	<i>Suicide group</i>	<i>Control group</i>
Sexual orientation	1 gay 1 lesbian	Heterosexual Heterosexual
Sexual abuse	— 1 female	—
Sexual dysfunctions	1 male: erectile dysfunction 4 females: 1 sexual desire impairment 2 sexual arousal+desire deficiency 1 sexual aversion disorder	1 male: erectile dysfunction —
Stable partner	8 males 6 females	11 males 11 females

All individuals with sexual dysfunctions had not undergone any diagnostic investigation or specific pharmacological treatment. In the CG, all fertile subjects had menstrual cycles.

psychoactive medications for a minimum of 1 year.¹⁶ Sexual impairments were not exclusively tied to the subjects' most recent partner. Relevant data of all patients are reported in Table 3.

Follow-up

Males. In the SG, one patient who attended follow-up committed suicide in 2003. In the SG, two male subjects never attended follow-up including the final visit. In the SG, one subject and his spouse decided to have a child and after withdrawing semen through electroejaculation, his partner underwent at that time an Intra Cytoplasmic Sperm Injection (ICSI); miscarriage occurred 3 weeks later. In the CG, two couples were included in an assisted fertility program and one case resulted in a full pregnancy.

Females. Two women in the SG attempted suicide again after SCI. In March and June 2005, only two females in the SG with a lumbar incomplete lesion (both degree C according to the ASIA scale) and having a stable partner started a pharmacological treatment for arousal disorders. They used Sildenafil 50 mg for 3 months. In one case, the FSFI score concerning this domain significantly increased (more than 60% compared with baseline) passing from 1.8 pretreatment to 3.3 at the end of the treatment, even though she lost these benefits after suspending the treatment. Both in the SG and CG, one woman of fertile age did not recover her menstrual cycle post-SCI by the final visit. One woman in the SG and one in the CG achieved full-pregnancy post-SCI.

Final follow-up

In the SG, three male subjects and one menopausal female did not attend the final visit, compared with one male and one female in the CG.

Risk factors for sexuality

In Table 4, we reported all possible risk factors for sexuality in pre-SCI and in the final visit. All smokers were chronic smokers (more than 3 years) and smoked at least 10

Table 4 Risk factors for sexuality of the two groups throughout the period of the study

<i>Risk factors for sexuality</i>	
<i>Suicide group pre-SCI</i>	<i>Suicide group final visit</i>
<i>Males</i>	<i>Males</i>
13 psychoactive medications	10 psychoactive medications
3 chronic smokers	2 chronic smokers
3 used drugs and alcohol	1 continued using drugs and alcohol
1 oral therapy for type II diabetes	1 oral therapy for type II diabetes
<i>Females</i>	<i>Females</i>
12 psychoactive therapies	12 psychoactive therapies
2 chronic smokers	1 chronic smoker
1 therapy for hypertension	1 therapy for hypertension
<i>Control group pre-SCI</i>	<i>Control group final visit</i>
<i>Males</i>	<i>Males</i>
2 chronic smokers	2 chronic smokers
1 therapy for hypertension	1 therapy for hypertension
	1 psychoactive medication
<i>Females</i>	<i>Females</i>
2 smokers	1 chronic smokers
1 hypercolesterolemia	1 hypercolesterolemia
	1 psychoactive medication

cigarettes a day. In the final visit, two men in the SG compared with pre-SCI stopped using drugs and/or alcohol, and one male and one female quit smoking. In the CG, one female quit smoking, whereas one man and one woman had been using antidepressive therapies for a minimum of 1 year.

Evaluation of sexuality

For both groups, all individuals were subdivided into four classes (A, B, C and D) according to the duration of their relationships. A, 0 to 6 months without a stable partner, or an occasional relationship; B, 6 months to 5 years; C, 5 to 10 years; D, 10 to 15 years.

Males. We reported the results of the IIEF5 score in the final visit, because in all male subjects we did not observe a significant change in their scores during follow-up (around

Table 5 Principal sexuality data of our sample in the final visit

Suicide group					Control group				
<i>Sexual dysfunctions</i>									
<i>Males</i>					<i>Males</i>				
8 erectile dysfunction					9 erectile dysfunction				
Median IIEF(5) 14.2 (range 12–17)					Median IIEF(5) 14.4 (range, 11–18)				
<i>Females</i>					<i>Females</i>				
3 desire+orgasmic					2 desire+orgasmic				
3 desire+arousal					2 desire+arousal				
2 desire+lubrication					2 desire+lubrication				
1 desire+pain					1 desire+pain				
<i>Therapies for sexual dysfunction</i>									
<i>Males</i>					<i>Males</i>				
5 ICPGE1 (5–20 mcg)					3 ICPGE1 (5–20 mcg)				
3 PDE-5 inhibitors (10–100 mg)					6 PDE-5 inhibitors (10–100 mg)				
<i>Females</i>					<i>Females</i>				
No therapies					No therapies				
Duration of relationship	A	B	C	D	A	B	C	D	D
Male	4	4	2	1	2	4	5	1	2
Female	5	3	3	1	2	3	4	1	3

Abbreviations: ICPGE1, intracavernosal Pge 1; PDE-5, Phosphodiesterase inhibitors-5; IIEF(5), International Index of Erectile Function.

20%). All patients with erectile dysfunction responded to various dosages of specific treatments: intracavernosal Pge1 or phosphodiesterase inhibitors-5.

Females. By means of anamnesis the presence of sexual dysfunctions was determined through the follow-up, and in the final visit in the same seven out of 12 patients (58.3%) in the CG compared with nine out of 12 (75%) in the SG. In those females, the domains of the FSFI scores ranged from a minimum of 0.8 to a maximum of 2.4, and the total score of the FSFI was less than 26. Females with no sexual dysfunctions in both groups reached a minimum score of 29 (range, 29–33). The principal data on sexuality are summarized in Table 5.

Overall sexual satisfaction (questions 14, 15 and 16 of the FSFI) for both groups is statistically correlated to the duration of the relationship with their partners using a linear regression test $P < 0.05$ (Figure 1).

Conclusions

In our sample, a peculiar aspect of SCI resulting from attempted suicide is the much higher ratio of women to men (approximately 1:1), compared with the Italian average with SCI where the male:female ratio is 4:1.

Sexual orientation represents a possible co-factor that increases the risk for attempted suicide. These findings are consistent with recent specific literature.¹⁷ Multilevel modeling analyses revealed that sexual orientation predicted suicidal ideation and suicide attempts up to three times more than heterosexual subjects.¹⁸

Additionally, one female reported a history of sexual abuse pre-SCI.¹⁹ As a consequence, this female presented sexual dissatisfaction even though she had a stable partner. In such

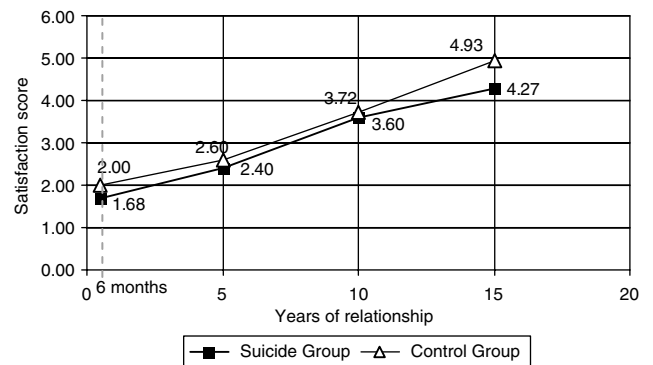


Figure 1 We distributed all the females according to the duration of relationship reporting the median score for the FSFI satisfaction domain.

cases, services should ensure a specific sexual program. In the final visit, this woman, following our advice, was attending group psychotherapy sessions for women molested in childhood.

In the SG, more patients suffered from sexual dysfunction pre-SCI compared with the CG. This higher presence of sexual impairments pre-SCI in the SG constitutes the main reason for the differences regarding the presence and degree of sexual impairments in the two groups post-SCI. Moreover, the SG showed higher risk factors for sexuality, mainly correlated to the chronic use of psychiatric drugs. Hence, physicians should know that it is fundamental to inform the patients that lifestyle factors such as chronic smoking and abuse of drugs and/or alcohol may damage sexuality; in doing so, physicians can help patients change their lifestyle/improve their quality of life. In the final assessment of the SG post-SCI, two out of three males stopped using drugs and/or

alcohol, and overall three out of nine chronic smokers quit smoking, whereas for the CG, the most negative factors for sexuality were that two subjects presented minor depression with concomitant use of chronic pharmacological treatments.

The most negative aspect concerning sexuality in the SG group, however, is the difficulty in establishing a stable relationship pre- and post-SCI compared with the CG. The lack of a stable relationship represents an obstacle in sexual rehabilitation for the SG; most patients in the CG had the same partner before SCI, thereby facilitating the recovery of overall sexual satisfaction and avoiding any sexual fear or inhibition to sexual activity. Particularly for females in our sample, an overall satisfactory sexual life is statistically correlated to the duration of the relationship, and a positive trend is evident in the CG males as well. Relationships where the non-injured partner has a greater understanding of the partner's sexual needs are more successful in sexual adjustment according to the Basson model,²⁰ and a long-lasting rapport with the spouse aids the couple in creating good overall sexual intimacy. In the SG, the majority of patients did not make further suicide attempts; however, a small yet significant proportion – 3 out of 27 (11.1%) – attempted suicide, one successfully, and this is cause for concern. Risk of persistent suicidal thoughts and suicide attempts is determined by a complex interplay of psychiatric history, neuroticism, traumatic life experiences and genetic vulnerability. Further research examining potential interactions between expression of genetic influence and particular environmental contexts may enhance prevention and intervention efforts.

References

- 1 World Health Organization. *The World Health Report 2001. Mental Health: New Understanding, New Hope*. WHO: Geneva, 2001.
- 2 Guaiana G, D'Avanzo B, Barbui C. Update of suicide trends in Italy from 1986 to 1996. *Soc Psychiatry Psychiatr Epidemiol* 2002; **37**: 267–270.
- 3 Hartkopp A, Bronnum-Hansen H, Seidenschnur AM, Biering-Sorensen F. Suicide in a spinal cord injured population: its relation to functional status. *Arch Phys Med Rehabil* 1998; **79**: 1356–1361.
- 4 Zhang J, McKeown RE, Hussey JR, Thompson SJ, Woods JR. Gender differences in risk factors for attempted suicide among young adults: findings from the Third National Health and Nutrition Examination Survey. *Ann Epidemiol* 2005; **15**: 167–174.
- 5 Baldessarini RJ, J. Genetics of suicide: an overview. *Harv Rev Psychiatry* 2004; **12**: 1–13.
- 6 Wichstrom L, Hegna K. Sexual orientation and suicide attempt: a longitudinal study of the general Norwegian adolescent population. *J Abnorm Psychol* 2003; **112**: 144–151.
- 7 Skegg K, Nada-Raja S, Dickson N, Paul C, Williams S. Sexual orientation and self-harm in men and women. *Am J Psychiatry* 2003; **160**: 541–546.
- 8 Blackwell CW, Ricks JL, Dzielgielewski SF. Discrimination of gays and lesbians: a social justice perspective. *J Health Soc Policy* 2004; **19**: 27–43.
- 9 Haenel T, Jehle O. Paraplegia after suicidal attempt. *Psychiatr Prax* 2003; **30**: 212–215.
- 10 American Spinal Injury Association. *International Standards for Neurological and Functional Classification of Spinal Cord Injury Revised 1996*. American Spinal Injury Association: Chicago, 1996.
- 11 Sokero TP, Melartin TK, Rytala HJ, Leskela US, Lestela-Mielonen PS, Isometsa ET. Suicidal ideation and attempts among psychiatric patients with major depressive disorder. *J Clin Psychiatry* 2003; **64**: 1094–1100.
- 12 Bacon CG, Mittleman MA, Kawachi I, Giovannucci E, Glasser DB, Rimm EB. A prospective study of risk factors for erectile dysfunction. *J Urol* 2006; **176**: 217–221.
- 13 Natali A, Mondaini N, Lombardi G, Del Popolo G, Rizzo M. Heavy smoking is an important risk factor for erectile dysfunction in young men. *Int J Impot Res* 2005; **17**: 227–230.
- 14 Meston CM. Validation of the female sexual function index (FSFI) in women with female orgasmic disorder and in women with hypoactive sexual desire disorder. *J Sex Marital Ther* 2003; **29**: 39–46.
- 15 Rosen RC, Riley A, Wagner G, Osterloh IH, Kirkpatrick J, Mishra A. The International Index of Erectile Function (IIEF): a multi-dimensional scale for assessment of erectile dysfunction. *Urology* 1997; **49**: 822.
- 16 Clayton DO, Shen WW. Psychotropic drug-induced sexual function disorders: diagnosis, incidence and management. *Drug Saf* 1998; **19**: 299–312.
- 17 Mathy RM. Suicide and sexual orientation. *Br J Psychiatry* 2004; **184**: 361–362.
- 18 M Balsam KF, Beauchaine TP, Mickey RM, Rothblum ED. Mental health of lesbian, gay, bisexual, and heterosexual siblings: effects of gender, sexual orientation, and family. *J Abnorm Psychol* 2005; **114**: 1–6.
- 19 Dube SR, Anda RE, Whitfield CL, Brown DW, Felitti VJ, Dong M *et al*. Long-term consequences of childhood sexual abuse by gender of victim. *Am J Prev Med* 2005; **28**: 430–438.
- 20 Basson R. A new model of female sexual response. *Sexual Dysf in Med* 2002; **2**: 72–77.