Chapter 3

Spinal Cord Injuries Following Suicide Attempts

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1. Introduction

Suicide has become an increasing concern as there are an estimated one million completed suicides per year worldwide. Suicide rates have increased by 60% over the last 50 years, particularly in developing countries. Suicide attempts are up to 20 times more. In 1996 more than 150,000 people committed suicide in 38 countries of the World Health Organization European Region. Suicide is currently one of the most important causes of death in Europe among young and middle-aged people, especially men. In some European Countries, in the age group 15-34, suicide ranks second among the most common causes of death. Nine of the ten countries with the highest suicide rates in the world are in the European Region [1].

In the EUROSAVE (European Review of Suicide and Violence Epidemiology) study, Finland had the highest suicide rate, while Greece had the lowest for the latest available year (1997). Greece also had the lowest undetermined deaths in 1984 and 1997 [2]. According to the Rutz and Wasserman study, increases in male adolescent suicide rates from 1979-1996 that were observed in Sweden, Ireland and Greece can partly be attributed to improved suicide statistics [3]. Botsis [4] suggests that in Greece formal statistics by the National Statistics Office are not representative of reality when they refer to reported suicides. Families avoid reporting suicide as the cause of death for religious reasons. Natural causes are reported instead.

Completed suicide rates for Greece (1960-2009) suggest a fluctuation between 2.8 and 4.0 per 100,000 for the years 1975 and 1985, respectively [1,5]. According to the table of Basic Statistics from Health for All (HFA) for the year 2006 in Greece there is a rate of 3.5 in suicides and self-inflicted injuries at all ages per 100,000. This rate is relatively stable for

the years 2000-2009 (3.5-3.6) [1]. Recently, Greece began to experience the effects of the extreme financial crisis, and reports in the mass media and journals support a possible casual link between the economic crisis and suicide rates. However, scientific data concerning this matter is still controversial [5-7].

In many European countries suicidal behavior constitutes a major public and mental health problem. It is also a considerable drain of resources in both primary and secondary health care settings [8]. Furthermore, adolescent suicide and attempted suicide have been recognized as a growing health problem in the rest of the world [9]. Young people of both sexes often make repeated suicide attempts [10-12]. Deliberate self-harm is also associated with increased risk of repetition and suicide [13,14].

Several possible theories have been proposed to explain the increased risk conferred by multiple attempts. One possibility is that multiple attempts reflect persistent risk factors (e.g., a chronic or recurring psychiatric disorder or adverse psychosocial conditions). Esposito et al. [15] studied 74 single attempters (SAs) and 47 multiple attempters (MAs; ages 12-18) seen in an emergency department after a suicide attempt and found higher rates of mood disorder diagnosis among MAs. Joiner [16], suggests that multiple suicide attempts increase the risk for subsequent attempts because practice allows MAs to acquire the ability to engage in more serious suicidal behavior.

In Greece, one study in 76 suicide attempters between the ages of 9-20 years, reported an 18-fold greater frequency of psychiatric disorder, 14-fold greater frequency of other problems (relational), 9.7-fold greater frequency of smoking and 4.7-fold greater frequency of psycho-social and environmental problems [17]. A six year retrospective study of self inflicted burns with ages ranging from 18-90 years concluded that of the 1435 admissions between April 1997-April 2003, 3.69% attempted suicide by self burn. Of these, females 57%, males 43%, with a high mortality rate of 75.4%. In 43.3% there was a preexisting psychiatric disorder [18].

A study in another internal medicine clinic from November 1999 to November 2000 of 146 drug intoxications, of which male 34.2% and female 65.8%, refers that 38.3% had a history of mental illness, 31.5% were in need of psychiatric help and 42.5% had a previous suicide attempt. Mental State Examination diagnoses included depression (20.96%), psychosis (15.32%), dysthymic disorder (16.2%), anxiety disorder (22.58%) and personality disorder (8.8%) [19]. Other studies refer to substance use increasing suicidal ideation or behavior [20], rising trends in male suicides, higher rates among widowed men [21,22], and an unusual peak in the summer [23], or spring and summer [21].

2. Spinal cord injury data

A substantial amount of research indicates that self-harm by falling is a rare phenomenon, accounting for 4–7% of suicidal deaths in the developed world [24,25]. The mostet common mode of attempted suicide is drug ingestion. Completed suicides and violent suicide attempts are less common and include hanging, falls/jumps, and firearms [26]. The incidence of different

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methods of suicide may vary from one country to another. In the United States for instance, jumping is among the least common methods of committing suicide (less than 2% of all reported suicides in the United States for 2005), while in Hong Kong, jumping is the most common method of committing suicide, accounting for 52.1% of all reported suicide cases in 2006 and similar rates for the years prior to that [27,28]. Community samples estimate that 8–10% of all those who attempt suicide will eventually die as a result of self-harm, most of these within 5 years of the attempt depending on the diagnosis [29,30].

Patients who attempt suicide by jumping from a height usually suffer from multiple injuries. These may be of two types: deceleration type injuries and direct impact injuries [31]. The former, which are internal organ injuries, result from the tendency to displace the tissue in the direction of motion upon impact, while the movement of the body is arrested by the ground [30]. A number of studies show that most of the patients who attempt suicide by jumping suffer from serious psychiatric disorders. These patients suffer from a broad spectrum of psychiatric symptoms: schizophrenia, depression, drugs or alcohol abuse, personality disorder and manic depression [32,33].

Spinal cord injury (SCI) literature estimates suicide as being responsible for approximately 5% of deaths, though this varies greatly between populations [24-37]. Risk tends to be higher in the years immediately post-injury, but there is an increased life-time risk if an individual has ever attempted suicide or self-harm [24].

Several studies have examined the post-injury predictions for patients who survived after a suicide attempt, and various findings arise. Haenel and Jehle [38], conducted a research in Switzerland, on patients who had become paraplegic after a suicide attempt, and who had to spend a certain time in the Basel and Nottwil (canton of Lucerne) centre for paraplegics. They evaluated the records and catamnestic date of 38 patients with a mean age of 38 years, between the years of 1982-1996 and a follow up study was conducted. Catamnestic investigations performed from one month to 14 years after the suicidal attempt were based on a structured dialogue with a standardized, computerized questionnaire. The results showed that the most frequently encountered suicidal method, leading to the paraplegic lesion, was a fall from a window of a building (89,6 %). In 55% of the cases, a psychiatric disorder had been diagnosed prior to the suicide attempt, with depression, alcohol and drug dependence appearing as the most common diagnoses. Thirty-seven per cent of patients had attempted suicide at least once before and 34 % had been hospitalized for psychiatric reasons prior to the incident. The paraplegic lesions of the patients were equally distributed between thoracic, cervical and lumbar lesions. The most disturbing problem reported by patients after the paralysis was sexual impairment. Despite the limited number of cases and the rather short interval between the suicide attempt and the follow-up investigation, results seem to indicate that such patients are not likely to commit suicide on a later occasion, excluding one single case.

Anderson and Allan [24] conducted a survey in a Scottish spinal rehabilitation unit, on the demographics and patients outcome with vertebral fracture after suicide attempt. Forty-six (44 having detailed data available) patients were identified with 95% of injuries resulting from falls. Thirty-six people had pre-existing mental health problems (82%) with 15 (34%) having this diagnosis established shortly after admission. Seventy-five per cent received follow-up

from mental health services. Ninety-five per cent returned to their pre-injury (or similar) residence. Length of stay and functional independence measure for the deliberate self harm group were compared with a non-deliberate self harm group. High levels of mental health and substance abuse problems were detected necessitating formal mental health assessment and follow-up. Deliberate self harm as a mechanism for injury appears to have a significant impact on length of stay in the centre only if the patient has fracture without spinal cord injuries. Immediate rehabilitation outcomes are similar to that of non-deliberate self-harm group. The authors noted in the limitations of the study that the sample size was small and a retrospective methodology concerning an accurate history and outcome was difficult. However, the particular study demonstrates that the patients benefited by their time in rehabilitation and had comparable outcomes to a non-deliberate self harm group in the short term. Despite the fact that substance and mental health problems were significant in this group, these difficulties appear to impact little on immediate rehabilitation and discharge.

Kennedy et al. [34], conducted a retrospective review examining the admission records of 137 individuals, of mean age 32, with SCI as a result of a suicide attempt between the period 1951 to 1992. The research took place in the National Spinal Injuries Centre in Stoke Mandeville Hospital in Bucks, UK. They explored and identified the type of psychiatric condition evident around the time of injury and reviewed outcome information of this sample with specific focus on mortality, especially further evidence of deliberate self harm. The subsequent database comprised among others, cause, level and completeness of injury, height fallen, psychiatric history, psychiatric diagnosis, date of last contact, further suicide attempts, date and cause of death, date and place of discharge. Previous suicide attempts had been made by 23%. The cause of injury in 85% of cases was 'falls'. Thirty-three people are known to have died, of whom eight (24%) committed suicide. During the period between the first and last SCI examined within this study (1951-1992) 1.6% (n=137) of the total sample of patients treated at the rehabilitation centre sustained an SCI as a result of a suicide attempt. Recommendations for further research include an adaptation of the psychological autopsy approach which would provide additional information to that which is normally available in actual suicides.

Stanford et al. [25], conducted a research to State SCI services at New South Wales, Australia to determine the incidence of acute SCI due to suicide attempt from 1970 to 2000. They examined demographics, injuries, mental illness, functional outcomes and nature of subsequent deaths of 2752 acute spinal cord injury admissions. Of these, 56 were attempted suicide (55 falls, one gun-shot wound). The median age was 30 years. Psychiatric diagnoses varied, the most common of which were personality disorder, schizophrenia, depression, chronic alcohol abuse, mood disorder and chronic substance abuse. Follow-up was available in 47 cases (84%) at an average of 8 years. Four subsequent deaths were by suicide. Community placement outcomes for survivors were good, however the subsequent death by suicide was high.

Biering et al. [35], during 1965 to 1987 examined 45 patients who were admitted to the Rehabilitation Hospital in Hornbaek, Denmark because of SCI due to suicide attempts. The median age at injury was 31 years. In 38 instances (84%), SCI was caused by jumps from buildings. 62% had previously been admitted to psychiatric hospitals, and 31% had previously attempted suicide. A follow up study was conducted in 1988-89. At follow up, 11 patients had

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died, 3 from suicide. Of the 34 alive at follow up, 7 had attempted suicide, and 2 reported suicidal thoughts. A 44% had had a psychiatric admission since the SCI and 56% were taking psychiatric medication.

In another research conducted by Christiansen and Jensen [39] in 2007, the incidence of repetition of suicide attempt, suicide and all deaths was examined, and the influence of psychiatric illness and socio-demographic factors on these was analysed. The study was a Danish register-based survival analysis that retrieved personal data on socio-economic, psychiatric and mortality conditions from various registers. Suicide-attempters (2.614) and non-attempters (39.210) were analysed being matched by gender, age and place of residence. The average follow-up period for suicide-attempters was 3.88 years, during which 271 of them died. By comparison, death occurred four times more often among suicide-attempters than among non-attempters. Suicide was far more common among attempters (61, 2.33%) than among non-attempters (16, 0.04%). A proportion of the attempters (31.33%) repeated their attempt within the follow-up period. The most reliable predictors for suicide and death were repetition, suicide attempt method and treatment for mental illness, while the most reliable predictors for repetition were age, gender and mental illness.

It is clear that the results of the different studies vary, but most of them agree, as Christiansen and Jensen [39] state, that individuals with a history of suicide attempts form a well-defined high-risk group for suicide, and are in need of treatment immediately after the episode. Staff attending to the physical and psychiatric needs of these patients must work together and should inform of the risk of subsequent suicidal behavior, after a first episode of attempted suicide. Furthermore, departments which are in contact with suicidal individuals need action plans to ensure that all such individuals receive proper treatment immediately after the suicide attempt. The injuries and life changing conditions following the suicide attempt, add to the existing problems of the patients, especially those with a psychiatric disorder. Further research could take a closer look at the individual factors that lead to mortality in the spinal cord injuries of the deliberate self-harm patients and perhaps suggest mechanisms to reduce mortality. It may also be profitable to examine the risk to self that all individuals bring with them into rehabilitation by merit of their past deliberate self harm or mental health history, as a way of better focused support for all of those with spinal cord injuries after rehabilitation [24].

3. Sample presentation

3.1. Patients and methods

Thirty-two patients (8 males and 24 females) that were treated for SCIs in the Athens University Orthopaedic Department, as a result of deliberate self harm, are presented. Their ages varied from 18 to 65 years, and the average age was 35 years. There were 16 singles (50%), 14 married (44%) and 2 divorced (6%) patients. Thirteen patients were employed (41%), six housewives (19%), seven unemployed (22%), three students / pupils (9%) and three with various occupations (9%). In terms of religion, 28 were Christian Orthodox (88%), one Roman Catholic (3%), one Jewish (3%), one Muslim (3%) and one (3%) with an unknown religious affiliation.

The cause of injury was a fall from a building in 29 cases (91%), a fall from a window in one case (3%), a fall from a bridge in one case (3%) and a fall inside the house in one case (3%). Concerning the level of injury, in 16 cases (50%) it was at the lumbar level, in 9 cases (28 %) at the cervical, in 5 cases (16%) at thoracic and 2 cases (6%) regarded the sacral vertebrae (Figures 1 and 2). In 20 cases (62.5%) the injury was incomplete and in 12 cases (37.5%) complete. The psychiatric diagnosis was schizophrenia in 12 patients (38%), depression in 8 patients (25%), drugs or alcohol abuse in 3 cases (9%), personality disorder in one patient (3%), bipolar disorder in one patient (3%), other psychiatric reasons in one patient (3%) and in 6 cases (19%) there was no specific diagnosis (generally marital or work related). The height of the falls ranged from 2 to 12 m and all patients landed on solid ground. Operative treatment which included laminectomies, spine instrumentation and fusion was performed in all patients.

Figure 1. Lateral radiograph showing a fracture of the sacrum.

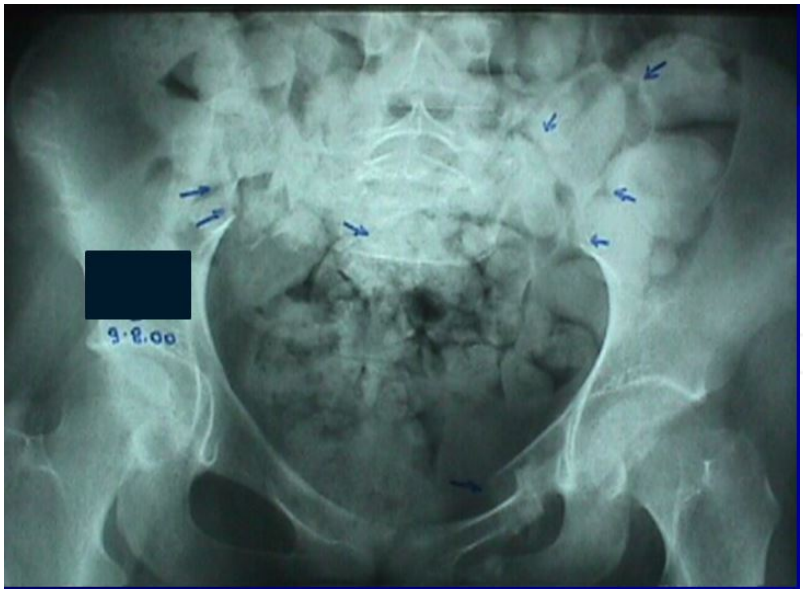

Figure 2. Anteroposterior radiograph of the same case.

3.2. Results

Initial clinical data of the 32 patients included in this study are shown in Table 1. At admission, ATLS guidelines were used for all patients. Associated injuries of the abdomen were present in five patients (patients 1, 4, 10 and 22). In these patients, a laparotomy was necessary for intraperitoneal bleeding, spleen and kidney injury, and mesenteric tear prior to the surgical operation for the spine fracture. Head injuries were revealed with CT scan in six patients (patients 3, 7, 8, 14, 26 and 30). In these cases craniotomy and decompression were performed first, before stabilization of the spinal fractures. Thoracic injuries (ribs fractures or sternum fracture) were present in three patients (patients 3, 5 and 28). Conservative treatment with assisted ventilation was necessary in these cases. Long bone fractures (femoral, tibial, bimalleolar, calcaneal, radial and humeral), including pelvic fractures, were treated by external fixation or closed reduction and immobilization in plaster or temporary splint. Subsequently, reduction and internal fixation, if required, were performed from 8 hours to 5 days later.

Regarding the treatment of the spinal fractures – dislocations, instrumentation devices including titanium rods, transpedicular screws, sacral bars and bone grafting were used on all patients. Patients were evaluated by a consulting psychiatrist as soon as their condition and cooperation permitted. Assessment included an interview and a complete mental status examination.

The only complications encountered were two cases of aspiration pneumonia, one of which resulted in prolonged stay on the intensive therapy unit due to difficulty weaning the patient

off the ventilator. All patients were discharged from hospital approximately 6–8 weeks after the operation with a custom-made thermoplastic thoracolumbar or lumbosacral orthosis for another 8 weeks and instructions for physical therapy and rehabilitation programs. After discharge 13 patients returned to their homes and 19 to another hospital or entered residential care.

Patient	Age/ gender	Mechanism of injury	Neurological deficits at admission	Associated Lesion	Surgical treatment	Follow-up	Recovery and outcome
1	23/F	Fall from building	Bowel and bladderdysfunction;saddle anesthesia;incomplete L5-S1 paraplegia	L4 fracture, humeral shaft fracture	Laminectomy; titanium rods and transpedicular screws, humeral external fixation	6 years	Recovery
2	18/M	Fall from building	Incomplete paraplegia	L2 fracture	Laminectomy; titanium rods and transpedicular screws	8 years	Recovery
3	34/F	Fall from building	Completeparaplegia	T9 fracture	Laminectomy; titanium rods and transpedicular screws	2 years	None
4	42/F	Fall from window	Incomplete paraplegia	L3 fracture	Laminectomy; titanium rods and transpedicular screws	18 months	Recovery
5	20/F	Fall from building	Completeparaplegia	T5 - T6 fracture, dislocation	Laminectomies; titanium rods and transpedicular screws	1 year	None
6	48/F	Fall from building	Incomplete paraplegia	L4 fracture	Laminectomy; titanium rods and transpedicular screws	5 years	Recovery
7	65/F	Fall from building	Incompletetetraplegia	C2 - C3 fracture, dislocation	Anterior plating	17 months	Death, second suicide attempt at 2 years

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8	56/M	Fall from building	Central cord syndrome	C2 - C3 fracture, dislocation	Anterior plating	2 years	Death (renal failure)
9	41/F	Fall from building	Incomplete paraplegia	L4 fracture	Laminectomy; titanium rods and transpedicular screws	22 months	Recovery
10	27/F	Fall from building	Completeparaplegia	L1 fracture	Laminectomy; titanium rods and transpedicular screws	10 years	None
11	31/F	Fall from building	Bowel and bladderdysfunction;saddle anesthesia;complete L4–S1paraplegia	L4 fracture	Laminectomy; titanium rods and transpedicular screws	9 years	None
12	39/M	Fall from building	Complete tetraplegia	C2 - C3 fracture, dislocation	AnteriorC2 - C3 plating	30 months	None
13	46/F	Fall from building	Complete tetraplegia	C2 - C3 fracture, dislocation	Anterior plating	25 months	None
14	51/F	Fall from building	Complete tetraplegia	C2 - C3 fracture	Anterior plating	3 years	Death (renal failure)
15	36/M	Fall from building	Incomplete tetraplegia	C7 fracture	Anterior plating	1 year	Recovery
16	19/F	Fall from building	Complete tetraplegia	C2 - C3 fracture, dislocation	Anterior plating	14 months	None
17	39/M	Fall from building	Incomplete paraplegia	Sacral fracture, Dennis III	Transiliac sacral bars	34 months	Recovery
18	41/F	Fall from bridge	Complete tetraplegia	C2 - C3 fracture, dislocation	Anterior plating	8 years	None
19	47/F	Fall from building	Incomplete paraplegia	L4 fracture	Laminectomy; titanium rods and transpedicular screws	3 years	Recovery

20	34/F	Fall from building	Incomplete paraplegia	L4 fracture	Laminectomy; titanium rods and transpedicular screws	1 year	Recovery
21	53/M	Fall from building	Complete paraplegia	Transverse fracture of the sacrum with anterior displacement	laminectomies; titanium rods and transpedicular screws; bone grafting	32 months	Death (pneumonia)
22	38/F	Fall from building	Incomplete paraplegia	L1 - L2 fracture, distal radius fracture	Laminectomies; titanium rods and transpedicular screws, cast for the distal radius fracture	23 months	Recovery
23	47/F	Fall from building	Brown - Sequard syndrome	T8 fracture	Laminectomy; titanium rods and transpedicular screws	2 years	Recovery
24	41/F	Fall from building	Incomplete paraplegia	L4 fracture	Laminectomy; titanium rods and transpedicular screws	4 years	Recovery
25	35/M	Fall inside the house	Incomplete paraplegia	L4 fracture	Laminectomy; titanium rods and transpedicular screws	15 months	Recovery
26	36/F	Fall from building	Incomplete tetraplegia	C6 - C7 fracture	Anterior plating	19 months	Recovery
27	27/F	Fall from building	Incomplete paraplegia	L5 fracture	Laminectomy; titanium rods and transpedicular screws	7 years	Recovery
28	33/F	Fall from building	Complete paraplegia	T9 - T10 fracture, dislocation	Laminectomies; titanium rods and	2 years	None

					transpedicular screws		
29	55/F	Fall from building	Incomplete paraplegia	L4 fracture	Laminectomy; titanium rods and transpedicular screws	31 months	Recovery
30	50/F	Fall from building	Complete paraplegia	T8 - T9 fracture, dislocation	Laminectomies; titanium rods and transpedicular screws	13 months	Death (renal failure)
31	44/F	Fall from building	Incomplete paraplegia	L3 fracture, distal radius fracture	Laminectomy; titanium rods and transpedicular screws, cast for the distal radius fracture	4 years	Recovery
32	23/M	Fall from building	Incomplete paraplegia	L4 fracture	Laminectomy; titanium rods and transpedicular screws	8 years	Recovery

Table 1. Clinical data of the patients

The mean follow-up was 6 years (range: 12 months – 10 years). At follow-up, only 27 of the patients were available for evaluation due to the death of 5 patients 1-3 years post injury. Of the five patients one had committed suicide (patient 7) and the other four had presented medical complications [renal failure in 3 patients (patients 8, 14 and 30) and pneumonia in one (patient 21)]. Of the remaining patients, two were involved in further unsuccessful suicide attempts due to psychiatric problems, 1 to 3 years post first injury (patients 10 and 24) (Table 1). All survivors received psychiatric follow-up.

3.3. Discussion

Adolescent suicide and attempted suicide have been recognized as a growing health problem in both Europe and the rest of the world [9]. The highest average person-based ratio of male: female suicide attempt rate was found in the age group 15-24 years (1: 1.9), the next highest in the age group 45-54 years (1: 1.7). This ratio decreases in the age group up to 55 to 1: 1.4 (range: 1:3.4 to 1:0.6) [40].

In the two Greek studies referring to attempted suicide hospitalized in internal medicine wards due to drug intoxication and self poisoning there is a definite precedence of females with the

first showing a percentage of male 34.2% and female 65.8% [22], and the second a ratio of male to female of 1:1.97 in an age group of 20-30 years [23]. Other studies also report parasuicide as more common in females and younger ages [41,42]. Contrarily, in the nationwide study of 1980-1995 of suicides a mean age-standardized rate of 5.86/100,000 males to 1.89/100,000 females was demonstrated. In addition, an increase in suicide rates was reported with age for males, with rising trends in the ages of 45-54yrs and decreasing rates for females in the 15-24yrs and 75-84yrs age group. Mostly violent methods are used among men [22]. This male to female trend is confirmed in the Epirus study where a mean age-standardized suicide rate per year 4/100,000 males was reported to 1.29 females/100,000. Once again a significant rising trend was shown for male suicides in the ages 35-44yrs and 65-74yrs, while low female rates were found in the under 35yrs age group [21].

In the current study, the ratio between males to females was 1:3. Females were more likely to make a more dangerous jump that increased their mortality. Others suggest that young males tended to use more lethal methods in attempts and to repeat more often than females [29]. A previous suicide attempt is in itself the strongest predictor of future suicide and local rates of attempted suicide and regional and national suicide rates in young people, especially males, are strongly correlated [43]. There is an association between repeated suicide attempts and completed suicide, particularly in males and when a violent method has been used [44,45].

The underlying psychology of suicide is complex and unique to each individual. However, certain themes emerge from studying individuals who have attempted or completed suicides. In all age groups, depression, alcohol and drug dependence, as well as history of mental illness are known to be risk factors for suicide [46]. Twenty percent of people who attempt suicide will make another attempt within the year, and 10% ultimately succeed [26]. Injuries resulting from direct impact are mostly fractures [47]. The area over which the impact force is applied influences the severity of the fractures [48]. The smaller the area over which the patients land, the greater the load/ unit area. Patients who land on their legs tend to sustain more serious injuries than those who land on their sides.

There were two main combinations of fractures in this series. The patients with spinal fracture combined with pelvic and extremity fractures. Only three of them sustained upper extremity fractures (patients 1, 22 and 31). Twelve patients presented with pelvic or lower extremity fractures associated with upper extremity fractures. The difference between the two groups shows that fractures in the upper extremities usually exclude fractures of the spine. Upon impact, the falling body has a kinetic energy which is converted, in its major part, into fracture energy. In the first group most of the kinetic energy is dissipated to the lower extremities, pelvis and spine, causing fractures at these sites. In the second group, patients use their upper extremities in an attempt to protect themselves, possibly via more flexion at the hip level. This increased flexion converts the remaining energy into forward rotational energy of the trunk exposing the extended upper extremities to fractures. It is probable that this form of energy dissipation protects the spine from fracture.

The initial treatment should be limited to life-saving procedures and short spine and limb stabilization procedures [49]. Fractures should be treated by methods that will allow early mobilization and transfer to the psychiatric ward. Treatment by traction or spica cast is not

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well tolerated by these patients and interferes with their nursing care. Rigid internal fixation, whenever possible for unstable fractures, is recommended.

The results of our study and others show that most of the patients who attempt suicide by jumping suffer from serious psychiatric disorders [32,33]. These patients suffer from a broad spectrum of psychiatric symptoms: schizophrenia, depression, drugs or alcohol abuse, personality disorder and manic depression. The proportion of patients with schizophrenia is far higher than found in general suicide attempts where it is estimated to range from 5% to 10%. Sometimes they have active suicidal ideation or even a detailed suicidal plan. Thus, the treatment approach for such patients must take into account their psychiatric state. The psychiatric manifestations create subjective distress for the patient and may hinder or even prevent the medical and surgical care of the patient in some instances [50].

In this sample of patients the fact that most individuals appeared to have responded to treatment, indicated that all admissions following self-harm should have access to appropriate psychiatric treatment. The finding that three of the patients within this study, attempted suicide following SCI, suggests that a small number of the people who have attempted suicide will re-attempt. We believe that routine screening for suicide and risk assessments might highlight those who are most at risk of re-attempting suicide, thus allowing healthcare professionals to be aware of these individuals and adopt appropriate strategies to address suicidal ideation and behavior.

The prevalence of psychiatric and mental health problems illustrated in this series highlights the importance of educating staff in the care of patients with mental health problems. In view of the special needs of these individuals, services should ensure regular follow-up to prevent deterioration and monitor progress. Moreover, future clinical research should also evaluate the specific problems of people who have both SCI and a psychiatric diagnosis.

4. Conclusions

Until now it has been difficult to obtain comparable international data on suicide attempts, owing to disparities in definitions, survey designs and study methods. It has been our experience that psychiatric conditions, and especially suicide risk, should be evaluated and treated as early as possible during the orthopaedic or surgical hospitalization. Management requires both psychopharmacological therapy and psychotherapy. It has to be directed towards the achievement of symptomatic relief and, if possible, towards the remission of the primary psychiatric disorder. The management of these patients in the orthopaedic or surgical ward is difficult, because of restlessness, noncooperation of the patient and the problem of staff inexperienced in handling the psychiatric patient. When prolonged orthopaedic and rehabilitation management is necessary, it is suggested that the patient be transferred to the psychiatric hospital while continuing the necessary orthopaedic treatment.

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