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ORIGINAL PAPER

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Suicidal ideation in prisoners: risk factors and relevance to suicidal behaviour. A prospective case-control study

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Abstract *Objective* To investigate risk factors for suicidal ideation (SI) in prisoners, as well as the prediction of suicidal behaviour by SI. *Method* Participants were recruited from the all-male, adults', high security prison of Patras, Greece. Sixty-seven prisoners who expressed SI were evaluated using a structured interview, Hamilton's Rating Scale for Anxiety (HAMA) and the Montgomery-Åsberg Rating Scale for Depression (MADRS). Sixty-seven control prisoners without SI, matched for age, nationality and penal status were evaluated using the same structured interview and rating scales. All participants were followed-up prospectively for 12 months after their initial assessment and any acts of self-destructive behaviour were recorded. *Results* Independent significant risk factors for SI in prisoners were the family history of suicidal behaviour (OR = 56.34, 95 % CI = 4.23–750.1, $p < 0.002$), history of psychiatric hospitalisation (OR = 7.18, 95 % CI = 1.83–28.16, $p < 0.005$), and higher scores in the MADRS ($p < 0.03$) and HAMA ($p < 0.03$) scales. During the follow-up period, suicidal behaviour (suicide attempt or self-mutilation) was observed in 12 (17.9 %) inmates with SI, as opposed to none of the controls ($p < 0.0001$). *Conclusion* A family history of suicidal behaviour, history of psychiatric hospitalisation and symptoms of anxiety or depression were independent risk factors for SI in prisoners. Inmates with SI had a higher risk for self-destructive acts at follow-up. Inmates with SI are a high-risk group for future self-destructive acts, so special precautions designed to reduce this risk are warranted.

Key words suicidal ideation · suicide attempt · self-mutilation · prison · risk factors

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Introduction

Suicidal behaviour in prisons is common and has attracted substantial research interest (Andersen 2004). Suicide has been found to be 11–14 times more prevalent in prison populations than in the general population (McKee 1998). Recent studies on the topic reported a striking increase of both absolute numbers of suicides and suicide rates for inmates hosted in secure correctional facilities (Joukaama 1997; Bogue and Power 1995; McDonald and Thomson 1993).

Most studies on suicidality in prisoners have been retrospective, based on case notes from the prisons or coroners records (Joukaama 1997; Bogue and Power 1995; Dooley 1990; Hayes 1989). The completed suicidal behaviour in prison is almost invariably an expression of mental suffering, depression, despair, severe anxiety and hopelessness (Andersen 2004).

The first phase of imprisonment has the highest risk of suicide (Shaw et al. 2004; Marcus and Alcabes 1993; Winkler 1992; Dooley 1990; Kerkoff and Bernasco 1990; Hayes 1989). Other factors that have been reported as predictors of suicide in prisons are the remand phase (Joukaama 1997; Bogue and Power 1995; Dooley 1990), history of psychiatric illness (Kovasznay et al. 2004; Pérez-Cárceles et al. 2001; He et al. 2001; Joukaama 1997; Marcus and Alcabes 1993; Copeland 1989), history of suicidal behaviour (Kovasznay et al. 2004; Pérez-Cárceles et al. 2001; He et al. 2001; Dooley 1990), isolation in a single cell (Liebling 1993), overcrowding in small cells (Marcus and Alcabes 1993), long-term sentences after violent crimes (DuRand et al. 1995), alcohol and illicit

drug use (Kovasznay et al. 2004; Backet 1987) and feelings of guilt (Dooley 1990).

In previous studies, a history of suicidal behaviour (suicide attempts, suicide threats) has been reported in 43–62 % of inmates who committed suicide (Fruehwald et al. 2003; Laishes 1997; Marcus and Alcabes 1993; Dooley 1990; Backett 1987). A recent case-control study by Fruehwald et al. (2004) stresses the importance of suicidal behaviour as an indicator of risk of suicide in correctional institutions, and the need for staff to take suicidal behaviour as seriously in custodial settings as in any other circumstances.

Data about Greek prisons are scarce in the psychiatric literature. Fotiadou et al. (2004) have investigated prisoners' previous history of deliberate self-harm among substance misusers. Spinellis and Themeli (1997) have investigated the suicide rates in Greek prisons, obtaining data from the records of the Greek Ministry of Justice and reported that an average of 4.65 suicides per year or 112 per 100,000 inmates classified as convicted, on remand or hospitalised was recorded for the years 1977 to 1996.

To our knowledge, no case-control study investigating SI in prisoners has been reported so far. Based on the aforementioned data, we conducted a case-control study in the prison of Patras, Greece, aiming to identify risk factors for SI, and to investigate the association of SI with subsequent suicidal behaviour in prisoners.

Methods

Participants

The participants for this study were recruited from the all-male, adults', high security prison of Patras "Aghios Stefanos". The prison is situated 20 km outside the city of Patras and hosts mostly convicted inmates with long sentences or life-timers.

During a 12-month period all inmates of Patras prison were screened for suicidal ideation in the past week of the interview by the 5-item questionnaire developed by Paykel et al. (1974). The 640 inmates screened represented the total group of prisoners and not a selected subgroup.

Sixty-seven prisoners, who had experienced SI in the past week of the interview, answered positively to the initial 4 questions of the 5-item questionnaire and were included in the study. Sixty-seven prisoners that reported that they had never experienced SI, matched for age, nationality and penal status were used as a control group.

The 5-item questionnaire by Paykel et al. (1974) has been used in studies investigating the pathway between suicidal ideation, thoughts, planning, attempts and completed suicide (Tyssen et al. 2004; Gunnell et al. 2004). The 5 questions are: (1) 'Have you ever felt that life was not worth living?' (2) 'Have you ever wished you were dead?' (3) 'Have you ever thought of taking your own life, even if you would not really do it?' (4) 'Have you ever reached the point where you seriously considered taking your life, or perhaps made plans how you would go about doing it?' (5) 'Have you ever made an attempt to take your own life?' In the present study, item 5 of the questionnaire that goes beyond SI has not been considered.

The 134 prisoners enrolled in this study were prospectively followed-up for 12 months after their initial assessment and any acts of self-destructive behaviour (suicide attempts or self-mutilations) were recorded.

Three prisoners (one with SI and two control subjects) refused to take part in the study or did not complete all the questionnaires.

The study was part of the "Health in Prisons" project, approved by the Greek Ministry of Justice for Ethics issues according to the Declaration of Helsinki and informed consent was obtained from all participants.

Questionnaires

A structured interview was administered to the participants of the study. The structured interview included questions that investigated demographic characteristics of prisoners, feelings of support by their family during imprisonment, penal status, history of psychiatric hospitalisation and history of illicit drug use (as reported by the prisoners).

Prisoners with SI answered questions about precipitating stressors, feelings of hopelessness, guilt or anger, wishes for death or change in their lives and plan of suicide. Additional questions in the structured interview investigated the history of suicide attempt as well as the history of self-mutilation among all participants. The history of self-mutilation was defined as any purposeful self-harm, committed without intent to die and resulting in tissue damage, most frequently cutting (Stanley et al. 2001).

To investigate the family history of suicidal behaviour, specific questions were asked about suicide attempts and completed suicides of parents, siblings, grandparents and children of all respondents. Questions were asked only about blood relatives.

Hamilton's Rating Scale for Anxiety (HAMA) (Hamilton 1959) was used to evaluate the severity of anxiety symptoms and the Montgomery-Åsberg Rating Scale for Depression (MADRS) (Montgomery and Åsberg 1979) to assess the severity of depressive symptoms. The HAMA is a 14-item scale with a score range between 0 and 56. Scores on the MADRS range between 0–60. Scores from 7 to19 refer to mild, 20 to 35 to moderate and ≥ 36 severe depression respectively.

Unfortunately, no standardised diagnosis of psychiatric disorders was obtained. Information regarding the prisoners' psychiatric hospitalisations and laboratory test results, including hepatitis C results were obtained from their medical and psychiatric records.

All questionnaires were administered by one of the authors (NPL), who had full access to the personal medical and psychiatric file of each inmate.

Statistical methods

Data were analysed using the Statistical Package for the Social Sciences (SPSS), Version 10. For univariate comparisons, statistical associations were estimated using Mann-Whitney U test for two samples in case of non-parametric comparisons and with Chi-square with Yates corrected p-value or Fisher's exact test in comparison of proportions. Odds Ratios and 95 % Confidence Intervals were also calculated for all categorical data. In order to define potential predictors of suicidal ideation in prison, all significant variables in univariate analysis were entered in multivariate logistic regression analysis. All statistical tests were two-sided and statistical significance was set at $p < 0.05$.

Results

The mean age of inmates expressing suicidal ideation (ISI) was 33.9 ± 9.7 years, while the mean age of the control subjects was 33.7 ± 9.7 years ($p = 0.909$).

No statistically significant differences between ISI and controls regarding marital status, family support, education, occupational status before imprisonment and crime were revealed (Table 1).

The majority of prisoners with SI (n = 27, 40.3 %) reported that hanging would be their preferred method of suicide, while 12 (17.9 %) reported that cutting would be

Table 1 Demographic characteristics and penal status of inmates with suicidal ideation and controls in Patras prison

Variable	ISI N = 67	Controls N = 67	OR (95% CI)	*P value
Married (%)	18 (26.9)	21 (31.3)	0.8 (0.36–1.81)	0.7
Family support (%)	15 (22.4)	13 (19.4)	1.2 (0.48–3.03)	0.83
Middle/High education (%)	34 (50.7)	38 (56.7)	0.79 (0.38–1.64)	0.6
Employed (%)	36 (53.7)	40 (59.7)	0.78 (0.37–1.64)	0.6
Penal status (%)				
On remand	10 (15)	16 (23.9)	0.56 (0.21–1.45)	0.27
Convicted	57 (82.6)	51 (76.1)	1.79 (0.69–4.82)	0.27
Crime (%)				
Drug-related	49 (73.1)	53 (79.1)	0.72 (0.3–1.72)	0.54
Other	18 (26.9)	14 (20.9)	1.39 (0.58–3.37)	0.54
Homicide	2	4	0.31 (0.02–2.75)	0.424
Robbery	6	5	0.90 (0.16–5.08)	0.814
Theft	10	5	2.25 (0.44–12.2)	0.448

ISI Inmates with Suicidal Ideation; *SD* Standard Deviation; *OR* Odds Ratio; *95% CI* 95% Confidence Intervals
* Yates corrected p-value

their preferred method of suicide. Seventeen (25.4%) of the inmates with SI reported that they were contemplating suicide but had no specific plan.

The most common feeling causing SI was anger, reported by 56 inmates (83.6%). Guilt was reported by 11 (16.4%) inmates, hopelessness by 14 (20.9%), wish to die by 25 (37.3%), and wish for change by 42 (62.7%).

Precipitating stressors reported by ISI were court problems (n = 13, 19.4%), family problems (n = 10, 14.9%), transfer problems (n = 8, 11.9%) and financial problems (n = 7, 10.4%). Twelve inmates (17.9%) reported various other precipitating stressors, while the remaining 15 inmates (25.4%) did not report any specific stressors for SI.

Rates of history of psychiatric hospitalisation, illegal substance use, anti-HCV status, use of psychotropic medication, history of suicide attempt and self-mutilation, and family history of suicidal behaviour of ISI and controls are shown in Table 2. Univariate regression analysis revealed a statistically significant association between seven variables and occurrence of SI. These were the history of psychiatric hospitalisation ($\chi^2 = 15.79$, $p < 0.0001$), history of self-mutilation ($\chi^2 = 12.11$, $p < 0.0001$), history of suicide attempt ($\chi^2 = 16.88$, $p < 0.0001$), family history of suicidal behaviour ($\chi^2 = 5.45$, $p < 0.02$), current anxiolytic medication intake ($\chi^2 = 20.85$, $p < 0.0001$), current antidepressant medication intake ($\chi^2 = 8.63$, $p < 0.003$), and current antipsychotic medication intake ($\chi^2 = 8.58$, $p < 0.003$).

Additionally, ISI when compared to controls showed significantly higher scores on the MADRS and HAMA. Mean scores (SD) of ISI as opposed to controls on MADRS were 25.2 (6.6) and 9.5 (8.5) respectively ($p < 0.0001$) and on HAMA 17.1 (4.1) and 7.2 (5.8) respectively ($p < 0.0001$).

Multivariate logistic regression analysis defined only four variables as independent risk factors for SI in prisoners, namely the family history of suicidal behaviour

Table 2 History of psychiatric hospitalisation, illegal substance use, anti-HCV status, use of psychotropic medication, history of suicide attempt and self-mutilation, and family history of suicidal behaviour of inmates with suicidal ideation and controls in Patras prison

Variables	ISI N = 67	Controls N = 67	OR (95% CI)	*p value
History of PH (%)	46 (68.7)	22 (32.8)	4.48 (2.05–9.89)	***0.0001***
History of substance use (%)				
Illicit non-IV drugs	23 (34.3)	25 (37.3)	0.88 (0.41–1.89)	0.85
Illicit IV drugs	33 (49.3)	24 (35.8)	1.74 (0.82–3.69)	0.16
Positive anti-HCV (%)	17 (25.4)	15 (22.4)	1.18 (0.49–2.83)	0.84
Current use of anxiolytics (%)	53 (79.1)	26 (38.8)	5.97 (2.61–13.92)	***0.0001***
Current use of antidepressants (%)	22 (32.8)	7 (10.4)	4.19 (1.54–12.54)	***0.003***
Current use of antipsychotics (%)	19 (28.3)	5 (7.5)	4.91 (1.6–17.85)	***0.003***
History of SM (%)	40 (59.7)	19 (28.4)	3.74 (1.72–8.23)	***0.0001***
History of SA (%)	37 (55.2)	13 (19.4)	5.12 (2.22–12.09)	***0.0001***
Family history of SB (%)	11 (16.4)	2 (3.0)	6.38 (1.30–60.96)	***0.02***

ISI Inmates with Suicidal Ideation; *PH* Psychiatric Hospitalisation; *SM* Self-Mutilation; *SA* Suicide Attempt; *SB* Suicidal Behaviour; *OR* Odds Ratio; *95% CI* 95% Confidence Intervals
* Yates corrected p-value. P values in italic bold are of statistically important significance

(OR = 56.34, 95 % CI = 4.23–750.1, p < 0.002), history of psychiatric hospitalisation (OR = 7.18, 95 % CI = 1.83–28.16, p < 0.005) and higher scores on MADRS (p < 0.03) and HAMA (p < 0.03) (Table 3).

During the 12-months of follow-up, suicidal behaviour was observed in 12 (17.9 %) inmates out of the group of ISI, as opposed to none of the controls (Fischer's exact test, p < 0.0001). Seven inmates (10.4 %) committed self-mutilating acts while five inmates (7.5 %) attempted suicide. Cutting (n = 6, 85.7 %) was the most common method of self-mutilation, while hanging (n = 5, 100 %) was the preferred method of suicide attempt. Fortunately all suicide attempts were unsuccessful.

No significant differences were observed in the initial assessment between the 12 ISI with vs the 55 ISI without suicidal behaviour (SB) during the 12-months of follow-up. Indicatively, both groups had similar scores in the depression and anxiety scales used. On the MADRS scale ISI with SB had a mean score (SD) of 22.4 (8.6) as opposed to the ISI without SB who had a mean score (SD) of 25.8 (6.1) (p = 0.108). The same applied for the HAMA scale, 16.6 (5.3) vs 17.2 (3.8) for the ISI with vs without SB, respectively (p = 0.627).

Discussion

Several studies focusing on epidemiological reports of suicide rates in custody have been conducted (Dooley 1990; Laishes 1997; Joukamaa 1997). A common conclusion is that suicide constitutes the most frequent cause of death among prisoners. The vast majority of these reports, which were retrospective, estimated risk factors for suicide and recorded suicide events retrieving data through official records. Whether a prompt identification of signs of suicidal behaviour expressed by an inmate could prevent a suicide act remains unclear.

The present study differs from previous studies of suicidality in prisons, in the methodology applied and the primary goal set. It was conducted in a sample representative for prisoners in Greece, to prospectively study the psychological profile and psychopathology of inmates expressing suicidal behaviour. To establish risk factors for suicidal ideation, the group of prisoners with SI was compared with a matched control group. Furthermore inmates were prospectively followed-up for 12 months after their initial assessment, to investigate the association of suicidal ideation and subsequent suicidal behaviour. However, it should be mentioned that a potential methodological limitation of the study is the lack of psychiatric diagnostic procedures (e. g. SCID).

Table 3 Independent characteristics for suicidal ideation in prison, using multivariate logistic regression analysis

Variable	OR	95 % CI	P value
History of PH	7.18	1.83–28.16	***0.005***
History of self-mutilation	0.57	0.14–2.23	0.42
History of suicide attempt	0.63	0.11–2.18	0.35
Family history of SB	56.34	4.23–750.1	***0.002***
Current use of anxiolytics	0.5	0.1–2.46	0.4
Current use of antidepressants	1.3	0.25–6.71	0.75
Current use of antipsychotics	2.01	0.32–12.79	0.46
HAMA scores	–	–	***0.03***
MADRS scores	–	–	***0.03***

OR Odds Ratio; *CI* Confidence Interval; *PH* Psychiatric Hospitalisation; *SB* Suicidal Behaviour; *HAMA* Hamilton Rating Scale for Anxiety; *MADRS* Montgomery-Åsberg Rating Scale for Depression

According to the results of the present study, inmates with suicidal ideation, when compared with matched controls, are significantly more likely to report a history of psychiatric hospitalisation, history of self-mutilation, history of suicide attempt, and family history of suicidal behaviour. They are also significantly more likely to score higher in the MADRS and HAMA rating scales and to be taking anxiolytic, antidepressant and antipsychotic medication. This is the more interesting: more inmates with drug treatment were found to have higher scores on MADRS and HAMA rating scales.

Of the factors mentioned above, only four factors (family history of suicidal behaviour, history of psychiatric hospitalisation, and higher scores in MADRS and HAMA) were found in multivariate logistic regression analysis to have independent effects on suicidal ideation in prison.

The association of family history of suicidal behaviour and suicidal ideation found in our study suggests that a familial risk of suicidal behaviour and suicidal ideation occurs in prison populations. Evidence that there is a pervasive tendency for suicidal behaviours to run in families has been confirmed by many previous clinical and community-based studies. Adoption, twin, and family studies have also shown that suicidal behaviour is familial (Goodwin et al. 2004; Fergusson et al. 2003; Runeson and Åsberg 2003; Brent et al. 2002; Cheng et al. 2000). Goodwin et al. (2004) showed that parental suicide attempt was associated with increased odds of suicidal ideation and suicide attempt among offspring, and that comorbid mental disorders contributed to these associations but did not completely account for them.

In the present study a history of psychiatric hospitalisation and higher scores in MADRS and HAMA were identified as independent risk factors for suicidal ideation in prisoners. A history of psychiatric illness has been identified as a predictor of completed suicide (Bradvik and Berglund 2004; Kovasznay et al. 2004; Bradvik 2002; Pérez-Cárceles et al. 2001; He et al. 2001; Joukaama 1997). Its association with suicidal ideation in prisoners had not been investigated until now.

Symptoms of depression and anxiety have been associated with suicidality in a prison population in the study by Penn et al. (2003). In their study of a sample of 289 adolescents admitted to a juvenile correctional facility, they found that suicidal clinically referred adolescents reported more depression, anxiety, and anger than

nonsuicidal youths. The majority (83.6 %) of prisoners with SI in our sample reported that feelings of anger were the reason for SI.

Precipitating stressors causing SI were reported by the majority (74.5 %) of prisoners with SI in our study. He et al. (2001) have previously suggested that important factors associated with increased risk of prison suicide include chronic and/or acute stressors. In their study of 25 completed suicides, they found that most of the victims had experienced chronic and/or acute stressors of acute trauma, disrupted relationship, sentence hearing, and/or medical condition.

The association between expressed suicidal ideation by prisoners and subsequent suicidal behaviour (suicide attempts and self-mutilation) is supported by the results of the present study. During the 12-months of follow-up, 12 inmates, all in the group of ISI, committed a self-mutilating act or a suicide attempt. Suicide attempts were all committed by hanging. As hanging is the commonest method of suicide in prisons, removal of potential ligature points from cells should be a priority (Shaw et al. 2004).

Suicidal thoughts are a key stage in the pathway leading to suicide (Gunnell et al. 2004). The suicidal process, a common underlying perspective on suicidal behaviour, describes suicidal behaviour as a continuum of gradually increasing seriousness: feelings that life is not worth living, thoughts of taking one's life, seriously considering suicide, suicidal planning, and suicidal attempt (Tyssen et al. 2004). Suicidal ideation is a significant risk factor for suicide in non-prison populations. In their prospective study Brown et al. (2000) followed 6891 psychiatric outpatients for 20 years and reported that the history of suicidal ideation was a significant and unique risk factor for eventual suicide.

Prevention of prison suicides has a high priority in most countries' prison programmes; however the predictors are difficult to deal with in daily prison life. Screening should focus on the identified risk factors for suicide (Andersen 2004). Although it has been stated that most prisoners who injure themselves – many repeatedly – do not go on to kill themselves (HM Chief Inspector of Prisons in England and Wales, 1999), Fruewald et al. (2004) in their recent case-control study showed that one of the most important predictors for suicide in custody was a history of suicidality (status following attempted suicide and suicide threat). Earlier, Fruehwald et al. (2003) had analysed the personal files of 220 inmates who committed suicide in the 29 Austrian jails and prisons between 1975 and 1999, and found that in 36.8 % of suicides a suicide threat had been reported by the prison authorities.

The findings of our study suggest that suicidal ideation should be considered a serious sign of future suicidal behaviour in prisoners, as it was shown that inmates with SI had a significantly higher risk for self-destructive acts at follow-up. Suicidal ideation should be followed by referral to psychiatric care, as well as by any further suitable measures (e. g. closer supervision, admission to a psychiatric hospital, medication) that would help prevention of suicide in prisoners.

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