Persistent nightmares are associated with repeat suicide attempt
A prospective study

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ABSTRACT

The aim of this prospective study was to determine if sleep disturbances and nightmares are associated with increased risk of repeat suicide attempt. Patients ($n = 165$) aged 18–68 years who were admitted to medical or psychiatric wards after a suicide attempt completed an initial interview; 98 of these took part in a 2-month follow-up interview. The Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) and two self-report instruments, the Uppsala Sleep Inventory and the Comprehensive Psychopathological Rating Scale (CPRS) Self-Rating Scale for Affective Syndromes, were administered both at baseline and follow-up. Data concerning repeat suicide attempts within 2 years were obtained from hospital records. Analyses were performed using Student's t-test, chi-square test, and logistic regression. In total 42 patients (26%) made at least one repeat suicide attempt within 2 years. While neither difficulties initiating/maintaining sleep nor early morning awakening at baseline predicted repeat attempt, having frequent nightmares did (OR = 3.15). The risk was further heightened when nightmares were reported at both baseline and 2-month follow-up (OR = 5.20). These associations remained after adjusting for sex, axis-I DSM-IV diagnoses, and self-reported depression and anxiety symptom intensity. Our findings suggest that nightmares might constitute a marker for increased risk of suicidal behavior.

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1. Introduction

Suicidal behaviors are associated with immense distress on the part of patients and their families. The management of patients who harm themselves generates work-related stress for psychiatrists (Fothergill et al., 2004) and nursing staff in both inpatient (Wilstrand et al., 2007) and outpatient (Thompson et al., 2008) settings, and it results in significant hospital costs (Sinclair et al., 2006). Those who repeat deliberate acts of self-harm are at increased risk for subsequent suicide compared with those with only one episode (Zahl and Hawton, 2004). The identification of those who are likely to repeat self-harmful behaviors is thus an important, but daunting, task for the clinician.

Predictors of repeat suicidal behavior within 1 year of index episode include psychiatric treatment, unemployment, being on sick leave, alcohol misuse, and having reported suicidal plans or hallucinations at the index episode (Kapur et al., 2006). There are a number of clinical (Fawcett et al., 1990; Agargun and Cartwright, 2003; Chellappa and Araujo, 2007) and population (Liu, 2004; Fujino et al., 2005) studies demonstrating a link between sleep disturbances

and suicidal behavior, but it remains unclear whether these constitute independent predictors of repeat suicide attempt. One sleep-related phenomenon of particular interest in this connection is nightmares. Clinical studies have demonstrated a relationship between nightmares and suicidal ideation in mental health outpatients (Bernert et al., 2005) and in psychiatric patients with melancholic major depression (Agargun et al., 2007). We recently reported an association between nightmares and suicidality in an unselected group of 165 consecutive patients who presented at a general hospital in connection with a suicide attempt (Sjöström et al., 2007). Two thirds of the attempters reported frequent nightmares at the baseline interview; frequent nightmares were associated with a five-fold risk for a high suicidality score. We now present results of a 2-year follow-up of the same cohort. The aim was to determine whether those who reported sleep disturbances in general and frequent nightmares in particular were at increased risk of repeat suicide attempt.

2. Methods

2.1. Patients

The study included patients aged 18–69 years who were admitted to medical or psychiatric wards at Sahlgrenska University Hospital after a suicide attempt during the period October 1, 2001–June 30, 2004. This hospital serves all residents of central and western Gothenburg (population about 210,000). It is the only hospital that provides emergency care in connection with suicide attempts in the catchment area. Criteria for inclusion were residence in the catchment area, at least basic knowledge of Swedish

Table 1
Associations between baseline sleep variables[a] and repeat suicide attempt within 2 years ($N = 165$).

	Repeat suicide attempt									
	No $n = 123$		Yes $n = 42$							
	n	%	n	%	χ^2	df	P	OR	95% CI	P
Difficulties initiating sleep	58	48	22	52	0.20	1	0.65	1.18	0.58–2.38	0.65
Difficulties maintaining sleep	43	36	19	45	1.09	1	0.30	1.46	0.71–2.98	0.30
Early morning awakening	40	33	21	50	3.68	1	0.06	2.00	0.98–4.09	0.06
Frequent nightmares	26	30	22	52	9.82	1	0.002	3.15	1.51–6.57	0.002
Adjusted models[b]										
Model 1								3.05	1.46–6.38	0.003
Model 2								3.04	1.41–6.62	0.004
Model 3								3.09	1.44–6.62	0.004
Model 4								2.28	1.04–4.99	0.04
Model 5								2.39	1.10–5.18	0.03
Model 6								2.65	1.22–5.58	0.013

[a] Uppsala Sleep Inventory rating ≥ 4 at index suicide attempt.
[b] Models adjusted for 1) sex; 2) major depression, other depression, substance use disorders, psychotic disorders, and anxiety disorders/other axis-I diagnoses; 3) PTSD; 4) depression symptom intensity; 5) anxiety symptom intensity; and 6) antidepressant drugs.

and cognitive capacity to understand the interview questions. In total 165 participated in the research interview in connection with the index suicide attempt (Sjöström et al., 2007), and 98 of these attended a 2-month follow-up interview. Two further patients accepted follow-up but died by suicide before the scheduled interview date.

2.2. Procedure

Face-to-face interviews were carried out at Sahlgrenska University Hospital by three experienced psychiatric nurses and one senior psychiatrist. The same instruments were employed at both interviews, and patients were assessed by the same interviewer on both occasions. The initial interview took place within a week after the index suicide attempt. Participants were asked if they wished to take part in a 2-month follow-up interview and those who agreed were sent a letter with information about the time and place for the follow-up. Persons who did not show up received a phone call from the interviewer to make another appointment. Data concerning repeat suicide attempts within 2 years were obtained from hospital case records.

2.3. Assessments

The Swedish version of the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (SCID-I) was used to assess Axis-I DSM-IV disorder. These were grouped according to the interview manual, i.e. mood disorder, psychotic disorder, alcohol/substance use disorder, and anxiety disorders/ other disturbances. The mood disorder group included major depression (including bipolar disorder and major depression with psychotic symptoms) and other depression (dysthymic disorder and depression NOS). An axis-I disorder was considered persistent if criteria were fulfilled at both baseline interview and 2-month follow-up.

Selected items from the Uppsala Sleep Inventory (USI) (Hetta et al., 1985; Broman et al., 2008; Edell-Gustafsson and Hetta, 2001; Mallon et al., 2002) were used to rate sleep disturbances. These included: difficulties initiating sleep, problems maintaining sleep and early morning awakening. The questions were to be answered on a five-point severity scale (1 = no problems, 2 = minor problems, 3 = moderate problems, 4 = severe problems, 5 = very severe problems). Further, the nightmare item was to be answered on a five-point frequency scale (1 = never, 2 = seldom, 3 = sometimes, 4 = often, 5 = very often). Responses for all sleep items were dichotomized (rating ≤ 3/ ≥ 4). A person who reported a score of ≥ 4 for a specific disturbance at both baseline interview and 2-month follow-up was considered to have a persistent sleep disturbance.

The CPRS Self-rating Scale for Affective Syndromes (Svanborg and Åsberg, 1994), which is based on the Comprehensive Psychopathological Rating Scale (Åsberg et al., 1978), was used to assess symptom burden. The depression subscale, which consists of nine items (mood, feelings of unease, sleep, appetite, ability to concentrate, initiative, emotional involvement, pessimism and zest for life), has been shown to be equivalent to the Beck Depression Inventory as a self-rating scale (Svanborg and Åsberg, 2001). The anxiety subscale also includes nine items (feelings of unease, irritability and anger, sleep, concern for health, worry over trifles, phobias, physical discomfort, aches and pains, and panic attacks). Items are rated from 0 to 6; each subscale has a maximum score of 54 points. Depression/anxiety subscale scores at index attempt were dichotomized (fourth quartile/all others). A person with a depression subscale score in the fourth quartile (≥ 34) was considered to have high depressive symptom intensity. Similarly, high anxiety symptom intensity was defined as an anxiety subscale score in the fourth quartile (≥ 29). A high depression subscale value (≥ 34) at both index attempt and 2-month follow-up was denoted persistent high depressive symptom intensity. A person with an anxiety subscale score ≥ 29 at both interviews was considered to have persistent

high anxiety symptom intensity. Eighty-eight persons in the total sample were prescribed antidepressants; this variable was dichotomized (yes/no) in the regression models.

2.4. Statistical analyses

Statistical calculations were performed using the Statistical Package for the Social Sciences (SPSS, Inc., Chicago, IL). The T-test was used to compare means of continuous variables. Pearson's chi-square test and Fisher's exact test were used to analyze differences in proportions. Univariate logistic regression was used to analyze associations between baseline sleep variables and repeat attempt in the total group ($n = 165$). The significant variable in the univariate analysis was then adjusted for sex (model 1), axis-I DSM-IV disorders (model 2), PTSD (model 3), high depression symptom intensity (model 4), high anxiety symptom intensity (model 5), and antidepressant medication (model 6).

In the subgroup with a follow-up interview ($n = 98$), associations between persistent sleep variables and repeat attempt were tested with univariate logistic regression. Significant sleep variables were included in a multivariate model and significant variables in this analysis were then adjusted for sex (model 1), persistent axis-I DSM-IV disorders (model 2), PTSD (model 3), persistent high depression symptom intensity (model 4), persistent high anxiety symptom intensity (model 5), and antidepressant medication (model 6).

2.5. Ethics

The Ethics Committee of the Medical Faculty of University of Gothenburg approved the project. Written informed consent was obtained from all participants.

3. Results

3.1. Baseline sleep disturbance and risk for repeat attempt

Out of 165 patients, 42 (26%) made at least one repeat suicide attempt within 2 years. Most (26 out of 42) occurred within a year of the index attempt. Proportions with difficulties initiating/maintaining sleep at baseline were similar in those with and without repeat attempt (Table 1). Half of the repeaters and one third of non-repeaters had reported early morning awakening at the initial interview, but the difference in proportions was not significant. Repeaters were more likely to have reported frequent nightmares at baseline. Univariate logistic regression was used to analyze associations between baseline sleep variables and repeat attempt. Table 1 shows that the presence of

Table 2
Demographic and clinical characteristics of suicide attempters with and without follow-up interview.

	Two-month follow-up						
	Yes, $n = 98$		No, $n = 67$				
	n	%	n	%	χ^2	df	P
Sociodemographic variables							
Male, $n = 36$	19	19	17	25	0.84	1	0.36
Married/cohabited, $n = 50$	29	30	21	31	0.04	1	0.84
Divorced/widow, $n = 55$	30	31	25	37	0.73	1	0.30
Single, $n = 60$	39	40	21	31	1.23	1	0.27
Education beyond mandatory, n							
Education beyond mandatory, $n = 122$	72	74	50	75	0.003	1	0.95
Unemployed, $n = 33$	19	19	14	21	0.08	1	0.78
Retired/pension, $n = 28$	12	12	16	24	4.01	1	**0.045**
Disorders at baseline							
Major depression, $n = 55$	36	37	19	28	1.26	1	0.26
Other depression, $n = 20$	11	11	9	13	0.18	1	0.70
PTSD[a], $n = 20$	11	11	9	13	0.18	1	0.67
Alcohol/substance use, $n = 41$	23	23	18	27	0.25	1	0.62
Psychotic disorders, $n = 11$	5	5	6	9	0.95[b]	1	0.36
Anxiety disorders/other, $n = 27$	18	18	9	13	0.71	1	0.40
No axis-I disorder, $n = 11$	5	5	6	9	0.95[b]	1	0.36
Sleep variables at baseline[c]							
Difficulties initiating sleep, $n = 80$	44	45	36	56	1.20	1	0.16
Difficulties maintaining sleep, $n = 62$	34	35	28	44	1.23	1	0.27
Early morning awakening, $n = 61$	32	33	29	45	2.64	1	0.10
Nightmares[c], $n = 52$	32	33	20	33	0.001	1	0.98

[a] Four had PTSD as the primary diagnosis and are included as anxiety disorders and other disorders. All others had another primary diagnosis: Major depression (6), Other depression (2), Alcohol/substance use disorder (4), and Psychosis (4).
[b] Fisher's exact test.
[c] Score ≥ 4 in accordance with the Uppsala Sleep Inventory.