

## The Zurich Study

### IX. Panic Disorder and Sporadic Panic: Symptoms, Diagnosis, Prevalence, and Overlap with Depression\*

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**Summary.** The purpose of the present epidemiological study is to investigate and describe panic disorder and sporadic panic attacks among a cohort of young adults, aged 28 years, from the Canton of Zurich in Switzerland. Both DSM-III panic disorder and sporadic panic are characterized by frequent symptoms of somatic anxiety and tension, as well as by frequent symptoms of depressed mood and low vitality. Sporadic panic is more prevalent than panic disorder and shows a greater excess of females over males. The association with depressions (major depression and recurrent brief depression) is similarly high for both types of panic syndromes, while the association with other anxiety disorders is negligible. Several indicators suggest a marked similarity between sporadic panic and DSM-III panic disorder. More impressive differences were observed between subjects with panic disorder alone and subjects with comorbidity of panic and depression. For the latter group, the SCL-90R scores indicated higher severity. Comparison of the scores of life events, conflicts, self-esteem, and the number of chronic problems in childhood suggests a more specific nosological pattern for subjects with panic and depression as compared with those with panic alone.

**Key words:** Epidemiology – Panic disorder – Sporadic panic – Diagnosis – Young adults

#### Introduction

Based on Klein's (1964) proposal the DSM-III (APA 1980) introduced panic disorder (PD) as a new anxiety disorder. Panic attacks were defined as discrete peri-

ods of intense apprehension or fear with at least 4 of 12 symptoms, and which are not precipitated by exposure to a phobic stimulus. PD is diagnosed when at least three panic attacks have occurred within a 3-week period.

The criticism of the borders of PD raised by clinical researchers is manifold. It was maintained that real attacks present a heterogeneous and variable spectrum of symptoms, which do not always include the psychic component of panic anxiety (Aronson 1987). Patients commonly confuse panic attacks with panicky anxiety, anticipatory anxiety and discrete somatic symptoms, and overestimate the frequency and duration of panic attacks, by confusing them with anticipatory anxiety (Aronson and Logue 1988). Furthermore, the cut-off point of three attacks in 3 weeks is strongly disputed. In clinical samples patients manifest periods with infrequent attacks that wax and wane (Katon 1986; Aronson 1987). The existence of such milder forms with fewer symptoms or attacks is confirmed by studies on the normal population. The Epidemiological Catchment Area (ECA) studies show that 7–9 per 1000 adults had recurrent attacks not meeting the frequency criterion, and 10–15 per 1000 had at least one attack in the previous 6 months (Von Korff et al. 1985). Norton et al. (1985) found 34.4% of subjects with at least one panic attack in the past year, and Salge et al. (1988) reported a prevalence rate of 14.1% of infrequent panic attacks among the normal population.

A major conceptual problem regarding the nosological borders is elicited by the fact that PD is often associated with major depression. A number of studies have shown that 50%–75% of patients with PD also suffer from major depression at some time in the course of their disorder (Cloninger et al. 1981; Coryell et al. 1988; Stein and Uhde 1988), many of them displaying both disorders at the same time. Patients with an anxiety disorder and secondary depression are

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likely to have a poorer overall outcome than those who do not develop depression (Van Valkenburg et al. 1984; Grunhaus et al. 1986). Several authors (Stein and Uhde 1988) challenge the notion that these depressions are secondary to the PD, because a number of patients had their first major depression months or years prior to their first panic attack. It is suggested that these concurrent depressions may be more severe, as measured by current symptoms and overall outcome than depressions that occur in patients with major depression alone (Coryell et al. 1988).

The fact that the definition of PD is still in a state of flux is reflected by the definition changes in the revised DSM-III-R (APA 1987). An important change was applied to the cut-off point concerning frequency. DSM-III-R allows two alternative possibilities: "Either four attacks, (...), have occurred within a 4-week period, or one or more attacks have been followed by a period of at least a month of persistent fear of having another attack" (APA 1987). Thus the crucial requirement of many attacks within a short time is loosened considerably. Furthermore, it was recognized that the hierarchical rule of DSM-III, which excludes a diagnosis of PD when major depression is present, should be eliminated to make it possible to give and study joint diagnoses (Spitzer and Williams 1985). Given these and many other discussions concerning the delineation of PD, it is not surprising that this diagnosis has a low level of reliability (Von Korff et al. 1985).

The majority of the studies cited above are based on clinical samples. Little is known about the distribution of panic attacks, their symptoms, their association with other syndromes, and their relation to social and psychological factors in the general population. The purpose of the present study is to investigate and describe the occurrence, symptomatology, and prevalence of PD and less frequent panic attacks among a cohort of young adults aged 28 years, from the normal population. Panic attacks below the threshold of DSM-III will be considered and compared with the DSM-III PD with regard to symptoms and severity. A central issue of this article is the overlap between PD and depressive disorders. Subjects with panic and with depression will be compared with regard to self-report in the SCL-90R, self-esteem and coping behaviour, and to psychological risk factors, such as conflicts and life events, childhood problems, and consumption habits. These analyses may contribute to the discussion about the classification of PD.

## Methods

*Subjects and Procedure.* The Zurich cohort study was started in 1978 with a representative sample of young adults aged 19–20 years from the Canton of Zurich, Switzerland. The cohort for the prospective interview study ( $n = 591$ ) was selected from this

sample ( $n = 4567$ ) according to Symptom Checklist 90 Scores (SCL-90R) (Derogatis 1977). Subjects with high scores (i.e. greater than the 85th percentile) made up two-thirds of the sample. The remainder of subjects (one-third) were randomly selected from those who scored below the 85th percentile (Angst et al. 1984). In 1979, at age 21, the cohort was interviewed for the first time ( $n = 591$ ) with a psychiatric interview developed in Zurich. Two follow-up interviews were carried out in 1981 ( $n = 456$ ) and in 1986 ( $n = 457$ ), when the cohort was 23 and 28 years old. A fourth interview wave has been completed in 1989. The drop-out rate between 1979 and 1986 was only 23%. The SCL-90R was administered six times in 1978, 1979, 1980, 1981, 1986, and 1988/89.

The instrument for the interview (SPIKE = structured psychopathological interview and rating of the social consequences of psychic disturbances for epidemiology) was developed for epidemiological studies and revised several times during the study. In the version of 1986, it embraces 21 psychic and somatic syndromes and, in addition, consumption of alcohol, tobacco, caffeine, and illicit drugs. For each syndrome a number of symptoms, the frequency and length of episodes, subjective suffering, treatment, age of onset, and social impairment were assessed. Subjective suffering, feelings of impairment at work, during leisure time, when in contact with friends, and with the partner were assessed on a visual analogous scale (1–100). With regard to treatment seeking, professional help (medical doctors, psychologists) and non-professional help were distinguished.

Further, all subjects were asked about problems in their childhood up to the age of 16 years. School anxiety, psychiatric treatment in childhood, and problems with and of their family were recorded. Desirable and undesirable life events which had occurred in the previous 12 months were assessed with an inventory modified after Tennant and Andrews (1976, 1977). Conflicts in relationships with parents, spouse, friends, and at work, which occurred in the 2 months before the interview, were recorded. For the measurement of self-concept and mastery, two scales developed by Pearlin and Schooler (1978) were used. After the interviews, subjects filled out the SCL-90R and mailed it to the research department. The SCL-90R is a self-assessment instrument with 90 graded items on psychopathology, which can be combined into nine symptom scales. In the Zurich study, a version referring to symptoms which have occurred within the last 4 weeks was applied.

The interview in 1986 was carried out by trained psychiatric residents and clinical psychologists. The syndrome of panic attacks was explored especially carefully, to allow distinction from panic feelings of everyday life, as well as from longer-lasting types of anxiety. However, the exploration of panic attacks was remarkably difficult at times, because some attacks are not unexpected or occur in situations where feelings of anxiety are common.

*Statistical Analyses.* Life events were weighted according to their stress potential, which was determined earlier in a cross-sectional study on a Swiss population (Binder et al. 1984), and added up to a total score. The scores for conflicts, mastery and self-esteem consist of the sum of the respective single items.

For group comparison of qualitative data, statistical analyses based on chi-square statistics were used.  $2 \times 2$  tables were compared with the chi-square test, associations were evaluated with the phi-coefficient. For the comparison of continuous data like the scores of subjective suffering or the SCL items and scales, non-parametric methods were applied, because the distributions were different from normal for all items and scores. For two-group comparisons, we used the Wilcoxon test; for three or more groups, the Kruskal-Wallis ANOVA was applied.

**Table 1.** Definition of diagnoses for sporadic panic and recurrent brief depression (RBD)

<i>Sporadic panic</i> (Zurich criteria)	
Symptoms	Panic attacks with 4 of 12 DSM-III panic symptoms
Frequency	Minimum of four attacks in 12 months; not three attacks in 3 weeks
<i>RBD</i> (Zurich criteria)	
Symptoms	Dysphoric mood or loss of interest or pleasure with four of eight symptoms of DSM-III major depression
Frequency	Minimum monthly in 12 months
Length/episode	Less than 2 weeks
Social consequences	Subjective impairment at work

**Diagnoses.** In the 1986 interview, the diagnoses of PD and major depression were assigned to the subjects exactly according to the criteria of DSM-III. For the interviews in 1979 and 1981, DSM-III criteria were approximated. For the diagnosis of PD, symptoms of somatic anxiety together with panic attacks were required. As the question "three attacks within 3 weeks" was missing, weekly attacks were needed for the diagnosis. Furthermore, a panic diagnosis with a lower threshold was introduced, called "sporadic panic". It demands panic attacks with the same symptoms as DSM-III, which occur at least four times over the past 12 months, but which do not fulfil the criterion of three attacks in 3 weeks. The diagnosis "sporadic panic" corresponds to the term "mild panic" used in other articles (Angst et al. 1989; Vollrath and Angst 1989a, b).

A new diagnosis of depression was also applied, "recurrent brief depression" (RBD), which requires four of the eight symptoms of DSM-III major depression (MDD), and additional impairment at work. In contrast to major depression, the depressive episodes in RBD last less than 2 weeks, but they recur at least monthly over 1 year (Angst 1988; Angst et al. 1988). The diagnostic criteria for sporadic panic and RBD are listed in Table 1.

## Results

### *Prevalence Rates and Sex-Specific Rates*

Table 2 shows the 1-year prevalence rates of DSM-III PD and sporadic panic at the three interviews, when the subjects were 21, 23, and 28 years old. To obtain these population estimates, sample frequencies were weighted back in order to compensate for the effect of oversampling the high scorers in the screening procedure. The rate of DSM-III PD remained fairly stable across the years, varying between 0.5% and 0.9%. Sporadic panic varied between 0.7% and 3.7%. In addition, the prevalence rates for major depression and RBD are presented. Depressions were more prevalent than PD or sporadic panic, and both types of depression occurred with similar rates of around 4%–9%.

**Table 2.** One-year prevalence rates<sup>a</sup> of sporadic panic, DSM-III panic, and depressive disorders at age 21, 23 and 28 years

	1979 Age 21	1981 Age 23	1986 Age 28
	<i>n</i> = 2599 <sup>a</sup>	<i>n</i> = 2011 <sup>a</sup>	<i>n</i> = 1930 <sup>a</sup>
	(%)	(%)	(%)
Sporadic panic	3.7	0.7	1.8
DSM-III panic	0.6	0.9	0.5
DSM-III MDD	4.5	6.8	7.3
RBD	4.2	5.1	9.4

<sup>a</sup>Weighted back to the normal population

**Table 3.** Sex differences of panic and depression at age 21, 23, and 28 years (unweighted frequencies)

		Males	Females	
1979		<i>n</i> = 292	<i>n</i> = 299	$\chi^2$ test
1981		<i>n</i> = 220	<i>n</i> = 236	
1986		<i>n</i> = 225	<i>n</i> = 232	<i>P</i> <
		( <i>n</i> )	( <i>n</i> )	
Sporadic panic	1979	4	31	0.001
	1981	5	9	NS
	1986	2	12	0.01
DSM-III panic	1979	8	7	NS
	1981	2	6	NS
	1986	3	6	NS
DSM-III MDD	1979	14	32	0.01
	1981	11	34	0.001
	1986	14	35	0.01
RBD	1979	24	34	NS
	1981	15	25	NS
	1986	22	35	NS

For the comparison by *sex*, unweighted sample frequencies are used (Table 3). Although the frequency of DSM-III PD is higher in females than in males at two of three interviews, the differences do not reach the level of significance in the chi-square test. Sporadic panic, however, is six to seven times more frequent in females than in males in the interviews 1979 and 1986. The sex difference for DSM-III MDD was very pronounced with a three-fold excess of females over males. RBD did not manifest such a clear preponderance of females and the sex differences are non-significant.

### *Comparison of Sporadic Panic and PD*

In the following, the new diagnosis of sporadic panic is compared with PD with regard to symptoms, treat-

**Table 4.** Anxiety symptoms of probands with sporadic panic (Zurich criteria) or DSM-III panic

	Sporadic panic	DSM- III panic	Total n = 23	Total n = 23
	n = 14	n = 9	n = 23	n = 23
	(n)	(n)	(n)	(%)
1. Nervous, irritable, impatient	12	8	20	87
2. <i>Palpitations</i>	12	7	19	83
3. <i>Feeling unsteady or faint</i>	11	8	19	83
4. Restlessness	11	7	18	78
5. Difficulty falling asleep	9	8	17	74
6. Difficulty concentrating	10	6	16	70
7. <i>Sweating</i>	10	5	15	65
8. <i>Fear of losing control</i>	7	8	15	65
9. <i>Feeling like suffocation, choking</i>	9	5	14	61
10. <i>Sense of unreality</i>	7	6	13	57
11. <i>Hot and cold flashes</i>	9	4	13	57
12. <i>Trembling</i>	5 <sup>a</sup>	8 <sup>a</sup>	13	57
13. Easily startled	8	5	13	57
14. <i>Shortness of breath (dyspnoea)</i>	8	4	12	52
15. Fatigue	4 <sup>a</sup>	8 <sup>a</sup>	12	52
16. Diarrhoea/belly aches	7	5	12	52
17. <i>Chest pain or discomfort</i>	5	6	11	48
18. Muscle tenseness, muscle aching	5	6	11	48
19. <i>Dizziness</i>	5	3	8	35
20. Frequent urination	4	4	8	35
21. Dry mouth	1 <sup>a</sup>	5 <sup>a</sup>	6	26
22. <i>Fear of going crazy</i>	3	3	6	26
23. Difficulty swallowing	3	2	5	22
24. <i>Numbness and tingling in hands/feet</i>	2	2	4	17
25. <i>Fear of dying during panic attack</i>	3	1	4	17
Total number of symptoms, mean	12.1	14.9	13.2	
SD	4.1	4.9	4.5	

<sup>a</sup>Chi-square test;  $P < 0.05$

The criteria for DSM-III panic disorder are italicized

ment rates, subjective suffering, age of onset, and overlap with other anxiety disorders and depression. These analyses are based on the interview in 1986, when the probands were 27 to 28 years old. Table 4 lists the frequency of 25 anxiety symptoms experienced during the attacks for the two types of panic syndromes. The symptoms which are criteria for panic attacks in the DSM-III are italicized. The other symptoms are those of somatic anxiety, often displayed by subjects with generalized anxiety disorder (GAD).

Six symptoms were reported by 70% or more of the cases. Among them only two criteria of DSM-III panic disorder are represented: palpitations, and feeling faint. The other four symptoms, nervousness, restlessness, difficulties falling asleep and difficulties concentrating are criteria of GAD. The symptoms sweating, fear of losing control, choking, sense of unreality, hot and cold flashes, trembling, and shortness of breath were reported by 50% or more of the cases. In addition, the GAD symptoms to be easily startled, fatigue, and diarrhoea or belly aches were experienced by more than half of the panic cases. Among the symptoms affirmed by less than half of the cases we found the panic symptoms of chest pain, dizziness, fear of going crazy, and, very rarely, paraesthesias (numbness/tingling), and fear of dying.

The distribution of the symptoms for subjects with sporadic panic was similar for subjects with DSM-III panic. Fear of losing control and trembling were the only panic symptoms reported by nearly all DSM-III panic cases, but only about half of the sporadic panic cases. Furthermore, the GAD symptoms of fatigue and dry mouth were more frequent in the PD group. The mean number of symptoms was 12 for sporadic panic, and 15 for PD. This difference is not significant.

Subjects with PD or sporadic panic also display a considerable amount of depressive symptoms (Table 5). Twenty of 23 subjects with either type of panic complained about feeling sad or depressed during the previous 12 months. Out of a list of 23 depressive symptoms, 14 were affirmed by more than half of the panicked. The most characteristic were sad mood, lack of energy, withdrawal, indecisiveness, loss of interests, and reduced sex drive. Other frequent symptoms were inhibition, feelings of worthlessness, feelings of guilt, and thoughts of death. Somatic depressive symptoms such as appetite and weight problems, or sleeping problems, were less frequent. Subjects with PD revealed a mean of 15 symptoms of depression, those with sporadic panic 12.

The treatment rates for sporadic panic and PD are presented in Table 6. Subjects with PD sought treatment more often than subjects with sporadic panic. When the treatment for depression is considered, too, the difference between the treatment rates is even more marked, with two-thirds of the cases with PD being treated in the year prior to the interview. Other treatment or self-treatment, such as consulting non-medical helpers, taking tranquilizers or doing relaxation exercises, however, is rare. Among the professionals consulted for PD, three were psychiatrists, four psychologists, and three general practitioners. Accordingly, 17 of 23 subjects ascribed their attacks to psychological causes, especially to threats such as fear

**Table 5.** Depressive symptoms of probands with sporadic panic or DSM-III panic

	Sporadic panic	DSM-III panic	Total	
	<i>n</i> = 14	<i>n</i> = 9	<i>n</i> = 23	<i>n</i> = 23
	( <i>n</i> )	( <i>n</i> )	( <i>n</i> )	(%)
1. Sad, depressed, unhappy	11	9	20	87
2. Without energy or initiative	11	8	19	83
3. Withdrawn, avoiding contacts	11	7	18	78
4. Difficulty thinking, indecisive	9	7	16	70
5. Loss of interests and activities	9	7	16	70
6. Decreased sex drive	8	8	16	70
7. Feelings of worthlessness	9	7	16	70
8. Anxious about ordinary tasks	9	6	15	65
9. Anxious about the future	8	7	15	65
10. Feeling inhibited, blocked	9	5	14	61
11. Feelings of guilt	6 <sup>a</sup>	8 <sup>a</sup>	14	61
12. Tired of living, wishing to die	6	7	13	57
13. Fearful to be alone	7	6	13	57
14. Sleeping badly, insomnia	7	5	12	52
15. Lack of appetite	7	4	11	48
16. Sleeping more, tiredness	6	5	11	48
17. Restless, constantly moving	5	6	11	48
18. Subjectively feeling slowed down in moving, talking	5	5	10	44
19. Cannot be cheered up by good news	3 <sup>a</sup>	6 <sup>a</sup>	9	39
20. Weight loss	3	4	7	30
21. More (sad) in the morning than in the evening	3	3	6	26
22. Increased appetite	2	2	4	17
23. Weight gain	1	1	2	9
Total number of symptoms, mean	11.1	14.8	12.5	
SD	7.1	4.1	6.3	

<sup>a</sup>Chi-square test;  $P < 0.03$

of being left alone, losing relatives by death, becoming ill, fear of childbirth or of ecological problems. Apart from that, stress at work and personal problems were also frequently mentioned.

Table 7 presents the degree of *subjective suffering* and impairment at work, during leisure time, and with social contacts. Subjective suffering during the attacks was very strong for both PD and sporadic panic. Still, those with sporadic panic suffered less extremely than those with PD. *Subjective impairment* at work, during

**Table 6.** Comparison of sporadic panic and DSM-III panic: professional and other treatment in the past 12 months

	Sporadic panic		DSM-III panic	
	<i>n</i> = 14	<i>n</i> = 9	<i>n</i> = 14	<i>n</i> = 9
	( <i>n</i> )	(%)	( <i>n</i> )	(%)
Professional treatment for panic	3	(21)	5	(56)
Professional treatment for panic or depression	4	(29)	6	(66)
Other treatment, self-treatment	2	(14)	2	(22)

**Table 7.** Comparison of sporadic panic and DSM-III panic: subjective suffering, impairment in different social areas, and age of onset

	Sporadic panic <i>n</i> = 14		DSM-III panic <i>n</i> = 9		Two-sample Wilcoxon test <i>P</i>
	Mean	Median	Mean	Median	
Subjective suffering	72.1	85	97.2	100	0.003
Subjective impairment at work	24.3	0	37.8	10	NS
Subjective impairment during at leisure time	20.4	0	45.6	20	NS
Subjective impairment with social contacts	12.5	0	42.2	50	NS
Troubles with partner	10.0	0	27.1	0	NS
Age of onset (years)	20.6	24.5	19.3	16	NS

leisure time or with social contacts was less severe. A tendency for lesser impairment in the sporadic panic group was not significant.

The distribution of the scores of impairment at work, during leisure time, and with social contacts is predominantly bimodal. Among the nine cases with DSM-III panic, five scored 0–10 on the working impairment scale and four scored 50–100. Among those with sporadic panic ( $n = 14$ ), ten scored 0 on the working impairment scale, one scored 40, and three scored 100. Subjective suffering was significantly correlated with impairment at leisure time ( $r = 0.42$ ; Spearman's) and social contacts ( $r = 0.46$ ), but not with impairment at work ( $r = 0.24$ ).

Age of onset was assessed in the 1986 interview. The mean age of onset was 19 years for PD and 21 years for sporadic panic (Table 7). The earliest panic

attack occurred at age 4, and 9 of 23 subjects with panic attacks placed their first attack between age 10 and 16. Only 4 subjects reported onset of panic during the 12 months preceding the interview. The remainder experienced their first attacks in their twenties.

All 14 cases with sporadic panic and 7 of 9 cases with DSM-III panic had experienced their last panic attacks in the 3 months prior to the interview. Therefore the SCL-90R, which refers to the last 4 weeks before the interview, was considered to be applicable as a measure of severity of psychopathology. Patients with both types of panic scored significantly higher on all nine SCL-90R-scales than subjects without a diagnosis of panic ( $P < 0.01$ ; Kruskal-Wallis ANOVA). The scores for sporadic panic and DSM-III panic, however, were very similar, and there was no tendency for subjects with DSM-III PD to score higher than those with sporadic panic on any scale. Therefore, the results are not presented.

#### *Overlap of Panic with Depression and with Other Anxiety Disorders*

The overlap of sporadic panic and PD with MDD and RBD at the three interviews is presented in Table 8. The total overlap of panic with depression, which figures in the third column, was considerable at all interviews. Between 48% and 61% of subjects with sporadic panic or PD also suffered from depression within the same year. Cases with sporadic panic showed similar rates of overlap with RBD and MDD as cases with PD. In the interviews 1979 and 1981, panic was more

**Table 8.** Association of panic with depression at interviews 1979, 1981 and 1986

		Sporadic panic	DSM-III panic	Sporadic panic + DSM-III panic
		$n = 35$	$n = 15$	$n = 50$
		$n = 14$	$n = 8$	$n = 22$
		$n = 14$	$n = 9$	$n = 23$
		(%)	(%)	(%)
RBD	1979	31	53	38
	1981	50	25	41
	1986	21	22	22
MDD	1979	9	13	10
	1981	7	25	14
	1986	36	44	39
RBD + MDD	1979	40	67	48
	1981	57	50	55
	1986	57	67	61

often associated with RBD than with MDD. Only in the 1986 interview did major depression prevail among the overlapping cases.

With regard to the overlap of sporadic panic and PD with GAD and phobias, the analyses were restricted to the interview 1986. Only in that interview were GAD and phobias separately assessed and defined according to the criteria of DSM-III. The results are reported briefly. Only one subject with panic disorder also fulfilled the criteria of GAD. Two subjects suffered from agoraphobia, a very rare diagnosis in the sample ( $n = 3$ ). The overlap with social and simple phobia was very small and not significant.

#### *Pure Panic, Pure Depression, and Mixed Panic Depression in the SCL-90R*

The previous analyses have demonstrated the importance of the overlap of panic with depression. In this section, subjects with pure panic (sporadic panic and DSM-III), panic with depression (RBD and MDD), and pure depression are compared with respect to the specificity and severity of their psychopathology by the SCL-90R. A separate analysis showed that the SCL-90R scores of subjects who suffered from panic or depression within the 3 months prior to the interview did not differ from those with panic or depression within 12 months prior to the interview. Therefore, the results of the total sample are presented.

Table 9 gives the SCL-90R *factor scores* for pure panic, pure depression, mixed panic with depression,

**Table 9.** SCL-90R scores for subjects with panic or depression

	Pure depression	Pure panic	Panic-depression	Controls	
SCL-90R Factors	$n = 88$ Mean	$n = 9$ Mean	$n = 14$ Mean	$n = 342$ Mean	ANOVA <sup>a</sup> $P$
Anxiety	1.8	2.3	2.4	1.4	NS
Depression	2.1	2.1	2.7	1.5	NS
Hostility	1.8	1.6	2.2	1.4	NS
Interpersonal sensitivity	2.0	2.1	2.5	1.5	NS
Obsessionality	2.0	2.0	2.3	1.5	NS
Paranoid ideation	2.0	1.7	2.1	1.6	NS
Phobia	1.4	1.8	2.2	1.2	0.001
Psychoticism	1.5	1.4	1.8	1.3	NS
Somatization	1.6	1.7	1.8	1.4	NS
Total score	1.8	1.9	2.2	1.4	NS

<sup>a</sup>Kruskal-Wallis ANOVA (depression – panic – panic and depression)

**Table 10.** Symptoms of phobia in the SCL-90R by diagnostic group

	Pure depression <i>n</i> = 88 Mean	Pure panic <i>n</i> = 9 Mean	Panic-depression <i>n</i> = 14 Mean	ANOVA <sup>a</sup> <i>P</i>	ANOVA <sup>b</sup> <i>P</i>
13. Afraid in open spaces, streets	1.2	1.9	2.4	0.0001	0.02
25. Afraid to go out of the house alone	1.2	1.6	1.9	0.0001	NS
47. Feeling afraid to travel on buses	1.0	1.6	1.4	0.001	0.01
50. Having to avoid certain things, places	1.8	1.9	2.6	0.01	NS
70. Feeling uneasy in crowds	1.6	2.2	2.7	0.0001	0.02
75. Feeling nervous when left alone	1.7	1.4	2.6	0.05	NS
82. Afraid you will faint in public	1.2	1.7	1.9	0.01	0.02
61. <sup>c</sup> Feeling uneasy when people are watching you	2.1	2.3	2.9	0.05	NS
73. <sup>c</sup> Uncomfortable about eating or drinking in public	1.3	1.9	1.8	0.02	0.04

<sup>a</sup> Three-group comparison Kruskal-Wallis ANOVA

<sup>b</sup> Pure depression vs. pure panic, Kruskal-Wallis ANOVA

<sup>c</sup> Items of interpersonal relationships

**Table 11.** Life events, conflicts, mastery and self-esteem by diagnostic group

	Pure depression <i>n</i> = 92 Mean	Pure panic <i>n</i> = 9 Mean	Panic-depression <i>n</i> = 14 Mean	Controls <i>n</i> = 342 Mean	ANOVA <sup>a</sup> <i>P</i>	ANOVA <sup>b</sup> <i>P</i>
Life event score	182.5	119.7	185.9	136.7	0.0001	NS
Conflict score	1.53	1.36	1.76	1.26	0.0001	NS
Mastery	13.7	13.1	13.1	15.5	0.0001	NS
Self-esteem	14.5	13.7	12.2	15.6	0.0001	0.02

<sup>a</sup> Four-group comparison, Kruskal-Wallis ANOVA

<sup>b</sup> Three-group comparison (pure depression – pure panic – panic and depression) Kruskal Wallis ANOVA

and for cases without diagnosis (controls). All three diagnostic groups scored markedly and significantly higher than controls on all SCL scales (four-group comparison; Kruskal-Wallis ANOVA;  $P < 0.001$  for all comparisons). When controls are excluded, only the scores of anxiety and phobia differ significantly between the three diagnostic groups. The SCL-90R score of anxiety is slightly more elevated for subjects with pure panic and mixed panic-depression compared with subjects with depression alone. Phobia scored lowest for subjects with pure depression, higher for those with pure panic and highest in the group with panic-depression. The SCL-90R depression score was not higher among the pure depressed than among the pure panic group. As for severity, the scores for the pure depression group and the pure panic group were on very similar levels, while those for mixed panic-depression were more elevated.

The items of the scale of phobia are more closely examined in Table 10, together with two items of interpersonal sensitivity. All nine items of this list differentiate significantly between the three diagnostic groups. The lowest scores are found in the pure depression group, higher scores in the pure panic group,

and top scores in the mixed group. The differences between pure panic and pure depression alone are significant for the items “afraid in open spaces”, “afraid to travel on buses”, “feeling uneasy in crowds”, “afraid to faint in public”, and “uncomfortable about eating or drinking in public”. Except for the last item, all these items indicate agoraphobia.

#### *Life Events, Conflicts, Mastery, Self-esteem, and Childhood Problems*

Do the three diagnostic groups differ with regard to psychological circumstances or factors which may trigger or accompany the disorder? In Table 11 the scores for life events, conflicts, mastery, and self-esteem are compared for probands with pure panic, pure depression, mixed panic-depression, and controls.

The *life event score*, which refers to life events which occurred in the previous 12 months, was strongly elevated for subjects with pure depression and mixed panic-depression compared with subjects with pure panic or controls. Further examination of the single items revealed that several particular events were significantly more frequent among those with

pure depression or mixed panic-depression than among those with pure panic. They are: „conflicts at work” ( $\chi^2$ ;  $df = 2$ ;  $P = 0.02$ ), “financial problems” ( $P = 0.000$ ), “conflicts with friends” ( $P = 0.02$ ), “increasing problems with partner” ( $P = 0.02$ ), “separation from partner” ( $P = 0.02$ ), “being left by partner” ( $P = 0.01$ ), “worsening of the relationship with the parents” ( $P = 0.02$ ), or “illness of parents” ( $P = 0.02$ ).

The *conflict score* was elevated among subjects with pure depression and panic-depression, the mixed group scoring highest, the control group lowest. The pure panic group scored lower than the two other diagnostic groups, but the difference is not significant. The *mastery* scale displayed lowered scores as compared with controls in all three diagnostic groups. The *self-esteem* score of the purely depressed was closest to that of the controls, while the lowest self-esteem was found among subjects with a mixed diagnosis of panic and depression. This is an unexpected result, because low self-esteem is normally closely associated with depression, but not necessarily with anxiety.

*Childhood problems* were reported by subjects with mixed panic-depression to an extraordinary high degree: 79% of the mixed cases, but only 35% of the purely depressed and 33% of the subjects with pure panic reported events which imply a lack of care and difficulties at home (chronic disorders of parents, alcoholism, frequent conflicts). Loss of a parent by death or separation, however, is not more frequent among those with panic than among those with depression or among controls. Seventeen percent of the purely depressed, 22% of the pure panic cases, 14% of the mixed cases, and 19% of controls experienced separation from a parent before age 16.

## Discussion

The results of this study on young adults demonstrate not only the occurrence of DSM-III PD in the normal population, but also the existence of a panic syndrome beyond the threshold of DSM-III. This syndrome, called “sporadic panic”, has the same symptoms as DSM-III PD, but does not fulfil the criterion of three attacks in 3 weeks. It shows a close similarity to DSM-III PD not only with respect to the core panic symptoms, but also with regard to additional symptoms of anxiety and depression. Both DSM-III PD and sporadic panic are characterized by frequent symptoms of somatic anxiety and tension, as well as by symptoms of depressed mood and low vitality.

As to the degree of severity of these two types of panic, our results are ambiguous. The SCL-90R does not indicate lower severity for sporadic panic either on

the subscales or the total score. However, treatment rates and the degree of subjective suffering indicate a higher severity for DSM-III panic compared with sporadic panic on a behavioural and a subjective level. The latter is in line with results of other studies finding a spectrum of severity in panic attacks which depend on the number of symptoms and frequency of attacks (Norton et al. 1985, 1986; Salge et al. 1988).

Cross-sectional comorbidity with both types of depression, MDD and RBD, is very high for both types of panic. More than half of the cases with either sporadic panic or DSM-III panic disorder had also been suffering from either RBD or MDD within the same year. Most investigators have stressed the importance of the association between PD and MDD (van Valkenburg et al. 1984; Grunhaus et al. 1986; Coryell et al. 1988; Stein and Uhde 1988). However, the high overlap of panic with RBD shows that it is important to include other forms of depression in the investigation of comorbidity.

The overlap of both forms of panic with other DSM-III anxiety disorders (GAD, phobias), and with obsessive-compulsive disorder is not significant at the age of 28 years. While the very small overlap with GAD justifies the separation of panic and GAD, our results concerning agoraphobia are less clear. Two of the three subjects who were diagnosed as agoraphobics also manifested PD or sporadic panic. Furthermore, subjects with panic manifested elevated scores in the SCL-90R items of phobia. These items mainly circumscribe agoraphobia. This result indicates an association between panic and agoraphobia, which, however, does not reach the diagnostic threshold in our sample. Longitudinal analyses will show whether those features develop into agoraphobia or decline when panic subsides.

Taken together, our results support the notion that there is no sharp delineation between sporadic panic and DSM-III PD. These findings put our study in line with clinical studies which showed that less frequent attacks do not reveal clear demarcation from PD (Katon 1986; Aronson 1987). The same has been demonstrated in epidemiological studies (Von Korff et al. 1985).

The core symptoms of panic reported by our subjects do not correspond completely with the criteria of the DSM-III and DSM-III R. Many panic attacks in our sample do not involve psychic anxiety, and the criteria “fear of dying” and “fear of going crazy” during attacks were only experienced by a small minority of our subjects. Symptoms of tension and somatic anxiety, considered typical of GAD, were present in nearly all subjects with PD. Moreover, even when a full-blown depressive disorder is not always present, the vast majority of probands with sporadic panic or



DSM-III panic also complained of a number of depressive symptoms. On the whole, the symptomatology of panic appears heterogenous, sharing symptoms with generalized anxiety disorder and with depression.

To our surprise, the self-assessment instrument SCL-90R differentiated very little between panic and depression on the level of factor scores, even when cases with a diagnostic overlap were taken into consideration as a separate group. The only clear distinction found concerned elevated scores of anxiety and phobia for subjects with panic with and without depression compared with those with depression only.

The 1-year prevalence rates at the three interviews were very similar both for DSM-III PD and for sporadic panic. For DSM-III PD, our rates below 1% are very similar to those found in the general population of the ECA studies (Weissman and Merikangas 1986; Weissman et al. 1988). Sex differences were very clear for subjects with panic. Females prevailed among subjects with DSM-III PD, and even more so among the milder cases. Age of onset for panic attacks seems relatively low in our cohort (19–21 years). However, the ECA data also indicate an excess of onsets in the 15- to 19-year age range (Von Korff et al. 1985).

Environmental and developmental risk factors appear not to be very specific for our subjects with panic attacks compared with subjects with depression or controls. Klein (1980) suggested that panic attacks are related to loss or threat of loss of an important person. Our cases with pure panic did not experience more life events or interpersonal conflicts than controls. However, those with pure depression and with panic and depression did report more separations and conflicts with significant others. Thus conflict and loss appear to be typical for depression, not for panic. This is in line with findings reported by Roy-Byrne and Uhde (1988) and by Torgersen (1985).

It has also been argued that patients with panic attacks had a higher incidence of childhood separation anxiety (Klein 1964; Klein 1980). This hypothesis could not be confirmed among our cases with pure panic. However, a majority of those with comorbidity of panic and depression at age 28 reported more long-lasting sources of distress such as chronic illness of a parent or chronic conflicts during childhood. Similar findings about an oppressive family atmosphere in the childhood of patients with mixed anxiety and depression were described by Alnaes and Torgersen (1989).

Scores on self-esteem and coping abilities (mastery) fail to discriminate between subjects with panic and depression. They are lower among either group than among controls. As low self-esteem was demonstrated to be specifically linked to depression in other studies (Brown and Harris 1979), this result may indi-

cate that low self-esteem is associated with more psychiatric disorders than is generally believed.

Other factors such as the consumption of alcohol, nicotine, or caffeine, seem to be of little importance in our young sample. Alcoholism is documented to occur with panic disorder in clinical studies (Roy-Byrne and Uhde 1988). Our cohort may still be too young for this combination. Also the comorbidity of alcoholism and panic disorder may be present in patient samples, but not in the general population. Caffeine and nicotine are supposed to trigger panic attacks (Roy-Byrne and Uhde 1988; Charney et al. 1985). Thus, either increased consumption or low consumption because of avoidance could be expected among subjects with panic. This was not found in our study, not even as a tendency.

For further investigation of PD, three aspects of research appear to be important. First, cases not fulfilling the DSM-III criterion of three attacks in 3 weeks should be included in studies about PD, and their symptoms and other features should be investigated carefully. Second, the overlap of panic with depression appears to be very important. Our results clearly indicate that subjects with panic and depression are more severely affected than subjects with panic alone. Together with some covarying developmental psychological factors, these results may even suggest a nosological separation between pure panic and panic with depression. Subjects in the latter group may resemble more strongly subjects with pure depression than subjects with pure panic. Third, not all risk factors such as high alcohol consumption or high sensitivity to caffeine and nicotine, which were found in clinical studies, were supported by our results, not even as a trend. However, our group sizes are small and our cohort is still very young. Further epidemiological studies, including also longitudinal approaches, are needed to clarify these issues.

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