

One-year Follow-up of Cardiac Anxiety Syndromes

Outcome and Predictors of Course

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Summary. In a representative sample ($n = 31$) of patients with panic attacks and a cardiac anxiety syndrome, a prospective follow-up study after a 1-year interval was performed. At the follow-up assessment 33% of the patients were in remission, whereas the majority of patients had an unfavorable course. Avoidance behavior and female sexual status were found to be predictive for an unfavorable course. Within a matched-pair design controlled for age and sex, no difference between panic disorder with and without cardiac anxiety syndrome was observed in any psychosocial or psychopathological outcome variable. This result is an argument against the validity of the subtype cardiac anxiety syndrome.

Key words: Follow-up study – Prediction of course – Cardiac neurosis – Panic attacks – Depression

Introduction

The core symptomatology of cardiac phobia is characterized by panic attacks with predominant subjective cardiac symptoms and cardiac complaints beyond the attacks (Gelder 1986). For the diagnosis of cardiac anxiety, some psychodynamic features are relevant (Hoffmann and Hochapfel 1983; Richter and Beckmann 1973) which are defined less clearly than the symptomatology. The etiological status of the hypothesized psychodynamic factors for the symptomatology is unresolved. Separation of symptomatology and psychodynamic factors using empirical research based on cardiac anxiety alone with present or previous phenomenology has merit. The pattern of symp-

toms characterizing cardiac phobia has been termed cardiac anxiety syndrome in this approach (Michaelis 1970; Maier et al. 1985).

Follow-up studies are necessary for validating a disorder or a syndrome, but these are rare in cardiac phobia or in the cardiac anxiety syndrome (Nutzinger and Zapotoczky 1985; Cremerius 1968; Christian et al. 1966) and insufficient from a methodological point of view. Most studies were retrospective, dealt with highly selected patients, and did not use diagnostic schedules with clearly defined criteria and evidenced reliability. Therefore, follow-up studies in cardiac anxiety are necessary for matching the following requirements: (a) prospective lay-out; (b) identification and classification of patients using standardized, criteria-based diagnostic procedures; (c) representative sampling by recruiting patients from all sites involved in the treatment of patients with cardiac anxiety syndromes; (d) assessment of symptomatology and psychosocial impairment by reliable procedures (e.g., structured or semistructured clinical interviews conducted by trained clinicians); and (e) comparison with a control group matched by sex and age.

The cardiac anxiety syndrome is a distinct subtype of anxiety disorders. However, the validity of the cardiac anxiety syndrome has not been evidenced up to now in comparison to panic attacks without cardiac anxiety syndrome. Previously (Maier et al. 1985), no significant differences with respect to cross-sectional features and aspects of previous course were found between patients with panic attacks and cardiac anxiety on the one hand and patients with panic attacks without cardiac anxiety on the other hand; but this study was limited by a retrospective and global assessment of the previous course which may reduce existing differences between the two groups com-

pared. Therefore, the sample has again been assessed after 1 year in order to perform a prospective assessment of psychosocial and psychopathological features. This follow-up study was designed to fulfill all methodological requirements listed above.

Patients and methods

1. Recruitment. To study the complete spectrum of panic anxiety – taking no etiology into account – 122 subjects were drawn from a variety of clinical settings during a 3-month period; only patients first contacting the site were taken into account. For evaluation, all patients without organic diseases and complaining of at least one panic attack in the previous 3 weeks were referred from the practices of two general practitioners, two internists, and three psychiatrists. Likewise, patients were recruited from the University outpatient departments of cardiology, psychosomatic medicine, and psychiatry as well as from the psychiatric inpatient clinic. Patients with prominent cardiac complaints during the panic attacks or with cardiac complaints not during the panic attacks received an extensive physical examination by a cardiologist according to the usual clinical requirements. Patients with cardiac diseases (including mitral valve prolapse syndrome) were excluded.

2. Sample. From the 122 recruited subjects, all patients with a history or presence of schizophrenia (DSM-III or RDC) or schizoaffective disorder (RDC) or schizophreniform disorder (DSM-III) were excluded ($n = 18$). All patients without at least one 3-weeks episode with three panic attacks were also excluded ($n = 7$). The index assessment was carried out in 97 patients; all patients fulfilled the criteria for panic disorder according to DSM-III-R (APA 1985). The classification of the sample according to DSM-III, Feighner Criteria, and ICD-9 has been presented elsewhere (Maier and Buller 1986). Initially, the patients received a self-rating questionnaire related to cardiac complaints and anxiety (Cardiac Anxiety Scale, CAS, by Kohnen and Benkert, 1985): e.g., obsession of suffering from an undiagnosed cardiac disorder; fear of dying of a cardiac disorder; frequent tachycardia and palpitations; frequent control of the activity of the heart. The questions focused on the periods when no panic attacks were present. The CAS was supplemented by an independent physician's rating of the cardiac complaints of the patient.

One year after index evaluation, patients were invited to a follow-up interview. Of the original 97 patients, 8 could not be located, 8 refused to cooperate, and 4 patients had died (3 cases from natural causes, 1 from suicid). The remaining 77 patients (80% of the original sample) were interviewed. Symptoms of this patient sample during the 1-year follow-up have been presented elsewhere (Buller et al. 1986).

3. Group Formation. Group formation was based on the following definition of cardiac anxiety syndrome. The following 5 conditions were necessary for a cardiac anxiety syndrome: (1) fear of dying of a cardiac disorder including when panic attacks were not present; (2) frequent occurrence of palpitations or tachycardia including when panic attacks were not present; (3) history of at least three panic attacks (as defined in DSM-III) with the following symptoms appearing during an attack; cardiovascular sensations (tachycardia) and fear of dying; (4) at least some of the attacks were unexpected; and (5) most of the symptoms during an attack were experienced within 10 min after the beginning of the attack.

A total of 27 patients who took part in a follow-up interview fulfilled these criteria. In addition, all of these patients believed they suffered from an undiagnosed cardiac disorder. At least sometimes, all 27 patients also controlled their cardiac activity (documented by items in the CAS questionnaire at the first assessment).

A subsample collected from the 50 patients without a cardiac anxiety syndrome was matched to the 27 patients with cardiac anxiety syndrome by age (± 5 years) and sex. In order to find a subsample clearly free from cardiac anxiety, patients believing that they suffered from or were going to die from an undiagnosed cardiac disorder ($n = 12$) were not matched to patients with a cardiac anxiety syndrome. The number of female patients in both groups was 20; the mean age was 40.2 years in the group with a cardiac syndrome and 41.8 years in the other group.

4. Treatment. Treatment was not standardized.

5. Assessments. Patients were rated by the Structured Clinical Interview (SCID) (Spitzer and Williams 1984) at the index episode by trained raters who had demonstrated sufficient reliability in 29 training sessions.

In the follow-up evaluation, the status of psychosocial functioning was assessed using the Longitudinal Interval Follow-up Evaluation (LIFE) – Boston Version (Shapiro and Keller 1981); the LIFE was modified in order to assess the 1-year follow-up instead of a 1/2 year follow-up. Psychosocial functioning at the time of the follow-up assessment was assessed by the GAS score (Spitzer and Endicott 1978).

Psychopathological variables were assessed using the structured clinical interview for DSM-III diagnoses (SCID) (Spitzer and Williams 1984) focusing on the last year. The follow-up evaluation was supplemented by asking semistructured questions not included in the SCID interview concerning features of the follow-up period, especially the temporal pattern of the occurrence of avoidance behavior, of generalized anxiety, of depression and dysthymia, the number of panic attacks, and the treatment for each month separately during the last year.

Remission was defined as the absence of any axis I disorder (DSM-III-R or DSM III) in the interval of 2 months previous to the follow-up assessment. Chronic anxiety was defined in this study by generalized anxiety syndrome (DSM-III-R) present most of the time during at least 11 months of the follow-up period; chronic depression was defined by dysthymic disorder (DSM-III-R) neglecting the exclusion criteria present for most of the time during at least 11 months of the follow-up period.

6. Statistical evaluation. The two groups under study (patients with and without a cardiac anxiety syndrome) were compared for change in symptomatology during the 1-year follow-up by the McNemar test or analysis of covariance (ANCOVA). The predictive ability of variables from the first assessment was estimated by testing the association with outcome variables using the χ^2 test; nonbinary variables were dichotomized at the median for this purpose.

Results

The cross-sectional features found at the index assessment have been reported in detail elsewhere (Maier et al. 1985). In all outcome measures under study, a heterogeneous 1-year course was observed in both groups.

Table 1. Comparison of social functioning between the week prior to index assessment and the week prior to follow-up assessment by Longitudinal Interval Follow-up Evaluation (LIFE)

	Percentage of <i>improved</i> patients		<i>P</i> value (McNemar test)
	Panic attacks with cardiac anxiety (<i>n</i> = 27)	Panic attacks without cardiac anxiety (<i>n</i> = 27)	
Work functioning	30%	42%	N.S.
Interpersonal relationship	36%	24%	N.S.
Recreational activities	54%	60%	N.S.
Subjective satisfaction	42%	54%	N.S.
Global assessment of social functioning	48%	54%	N.S.

Table 2. Comparison of the frequencies of syndromes between the year prior to index assessment and prior to follow-up assessment by structured clinical interview for DSM-III diagnoses (SCID)

	Panic attacks with cardiac anxiety (<i>n</i> = 27)		Panic attacks without cardiac anxiety (<i>n</i> = 27)		<i>P</i> value
	First assessment	Follow-up assessment	First assessment	Follow-up assessment	
Frequency of panic attacks					
Last week	3.7	2.0	4.5	3.2	N.S. ^a
Worst week	7.8	5.5	11.4	5.1	N.S. ^a
Number of patients:					
Without panic attacks last week	0	13	0	12	N.S. ^b
Without panic attacks last ½ year	0	6	0	8	N.S. ^b
Avoidance behavior	17	10	14	9	N.S. ^b
Chronic anxiety	17	15	13	12	N.S. ^b

^a ANCOVA for comparing follow-up assessment controlled for index assessment^b McNemar test for comparing follow-up assessments

Psychosocial Variables

The rate of improvement assessed by LIFE items and the GAS score was most impressive for the variable "recreational activities" (57%); the lowest rate of improvement was observed for interpersonal relations (30%) (Table 1). No significant differences could be found comparing the patients with cardiac anxiety to those without cardiac anxiety (Table 1).

Treatment

Most patients received benzodiazepines (but no alprazolam or clonazepam) during the 1-year follow-up period: 22 patients in the group with cardiac anxiety, 20 patients in the group without cardiac anxiety (mean duration of benzodiazepine treatment in patients who received these drugs: 5.2 months and 4.7 months). Antidepressants were intermittently given only when a prominent depressive syndrome was present: 13 patients in the group with cardiac anxiety syndromes and 11 patients in the group without car-

diac anxiety syndromes received antidepressant treatment at any time during the 1-year follow-up period (mean duration of antidepressant treatment in patients who received these drugs: 2.8 months and 2.4 months). No patient received psychotherapeutic treatment. No difference in the manner of treatment (duration of benzodiazepine or duration of antidepressant treatment) was observed between the two groups.

Psychopathological Variables

On average, all psychopathological variables under study demonstrated improvement in the total sample (*n* = 54). Improvement was significant for the frequency of panic attacks in the last week prior to assessment ($P < 0.05$) and for the presence of avoidance behavior ($P < 0.05$).

The frequency of chronic anxiety (duration 1 year) and the frequency of chronic depression (duration 1 year) did not change significantly ($P > 0.05$); the

Table 3. Comparison of the frequencies of syndromes between the year prior to index assessment and the year prior to follow-up assessment by SCID

	Panic attacks with cardiac anxiety (<i>n</i> = 27)		Panic attacks without cardiac anxiety (<i>n</i> = 27)		<i>P</i> value
	First assessment	Follow-up assessment	First assessment	Follow-up assessment	
Major depressive episode	10	10	15	10	N.S. ^a
Chronic depression	9	7	13	11	N.S. ^a

^a McNemar test for comparing follow-up assessments

Table 4. Predictive factors for remission during the 1-year follow-up; for each of both groups to be compared, empirical *P* values for the association (χ^2) between the predictor and the follow-up status are given

Predictor	Panic attacks with cardiac anxiety (<i>n</i> = 27)	Panic attacks without cardiac anxiety (<i>n</i> = 27)
Sex (male/female)	<i>P</i> = 0.03	<i>P</i> = 0.04
Age ^a	<i>P</i> > 0.10	<i>P</i> > 0.10
Frequency of panic attacks ^a	<i>P</i> > 0.10	<i>P</i> > 0.10
Avoidance behavior	<i>P</i> = 0.02	<i>P</i> = 0.02
Chronic anxiety	<i>P</i> > 0.10	<i>P</i> > 0.10
History of major depressive episode	<i>P</i> = 0.05	<i>P</i> > 0.10
Secondary depression ^b	<i>P</i> = 0.04	<i>P</i> = 0.07
Chronic depression ^b	<i>P</i> > 0.10	<i>P</i> > 0.10
Duration ^a	<i>P</i> = 0.07	<i>P</i> = 0.10

^a Nonbinary variables were dichotomized at the median

^b The associations are calculated only for patients without a primary depression

frequency of major depression did not differ significantly between the two different times in each group.

No significant difference was observed between the two subgroups (*P* > 0.05) in the rate of improvement of any psychopathological variable (Tables 2 and 3).

In addition, we defined remission as absence of panic attacks and any disorder of axis I in DSM-III-R or DSM-III within the last 2 months prior to follow-up assessment. Nine patient with cardiac anxiety and 10 patients without cardiac anxiety were found to be in remission in this sense; this result indicated no significant difference between the two groups.

Predictive Factors

The predictive ability of sociodemographic variables and the psychopathological status at index assessment for remission was assessed for each of the groups separately.

Female patients were associated with a lower rate of remission in both groups (*P* < 0.05). Age (dichotomized at the median) and marital status were not predictive for the rate of remission in any group (*P* < 0.05) (Table 4).

Avoidance behavior was associated with a lower rate of remission in both groups (*P* = 0.02). A history of an episode of major depression was associated with a lower rate of remission in patients with a cardiac anxiety syndrome at a marginal significance level (*P* = 0.05) and was not significantly associated with the rate of remission for the comparison group (*P* = 0.10) (Table 4).

Patients with primary depression were excluded in order to evaluate the predictive status of secondary depression in both groups. In this way, 2 patients in the group with cardiac anxiety and 5 patients in the group without cardiac anxiety were excluded. Secondary depression was predictive (*P* = 0.04) in the group of patients with cardiac anxiety for a low rate of remission; secondary depression was also marginally predictive in the group of patients with panic attacks without cardiac anxiety (*P* = 0.07). Neither the frequency of panic attacks in the last week prior to index assessment nor the presence of chronic anxiety or chronic depression were found to be predictive (*P* > 0.10). The duration of illness reported in the first assessment had a predictive ability with marginal significance (*P* = 0.07) in the group of patients with cardiac anxiety (Table 4).

Discussion

Follow-up of Cardiac Anxiety Syndrome

The majority of patients with cardiac anxiety syndrome showed a chronic course of the disorder during the 1-year follow-up period; in spite of an overall improvement, only 33% of the patients with cardiac anxiety had been free of psychiatric symptoms during the last 2 months prior to the follow-up assessment. This result is in line with all previous studies dedicated to the follow-up of cardiac anxiety (Christian et

al. 1966; Cremerius 1968; Nutzinger and Zapatoczký 1985) stating that the majority of patients have a chronic or unfavorable course.

On the other hand, we found, in accordance with previous retrospective studies (Cremerius 1968) that the course of this syndrome was heterogeneous. An association between symptoms of phobia and chronic course has been reported. In the data presented, avoidance behavior was predictive for an unfavorable course, supporting the hypothesis that chronicity is associated with phobic behavior.

Some investigators have stressed the role of secondary depression in the cardiac anxiety syndrome and in anxiety neurosis (Clancy et al. 1978; Noyes et al. 1980). We could only find marginal significance of a secondary depressive syndrome for an unfavorable course. It should be noticed that secondary depression and agoraphobia are highly associated ($P < 0.05$, χ^2 association) (Buller et al. 1986); this finding gives rise to the supposition that secondary depression and agoraphobia are not independent in predicting the course.

Female sexual status was strongly predictive for a lower rate of remission. No other data on the predictive ability of sex in cardiac anxiety are available. But in the whole group of anxiety states, the predictive status of sex is controversial (Noyes et al. 1980); cultural factors may modify the predictive status of sex in anxiety states.

Course Validity of the Cardiac Anxiety Syndrome

Discrimination between patients with a cardiac anxiety syndrome and patients without a cardiac anxiety syndrome was not possible by psychosocial or psychopathological outcome variables. It may be argued that the number of patients in both groups was too low. But the relatively low number of patients in the two groups compared ($n = 27$) was balanced by the matched-pair design. This procedure enhanced the power of the tests performed.

The inability to discriminate between the two groups by follow-up data confirms the hypothesis (Maier et al. 1985) that the cardiac anxiety syndrome is a subtype of panic attacks without sufficient validity. Previously, this thesis was supported by cross-sectional symptomatology and by aspects of course assessed retrospectively. Taking both studies together, the validity of the subtype of cardiac anxiety syndrome is doubtful. However, differences between both groups in psychophysiological and/or biochemical variables cannot be ruled out by this study.

The conclusions drawn from this study are limited by the fact that patients did not receive standardized medication during the 1-year follow-up. But standar-

dized treatment would be possible only for a subgroup of the sample recruited at the first assessment; the representivity of the sample would be significantly reduced in this way. This methodological limitation probably does not induce a bias, for the medication was comparable between both groups. However, studies are still necessary to compare both groups according to their treatment response in order to further clarify the validity of the cardiac anxiety syndrome.

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