

Predictive validity of neurotic disorders: a 50-year follow-up study

Peter Winning Jepsen¹, Birgitte Butler², Stig Rasmussen³, Knud Juel⁴ & Per Bech²

ABSTRACT

INTRODUCTION: In 1965, Erling Jacobsen (1919-1988) defended his doctoral thesis on neurosis in which he tested the psychoanalytic theory of eridophobia as an internalising hostility factor with a specific causality for anxiety neurosis. He found no marked difference between anxiety neurosis and obsessive-compulsive neurosis, which, however, both differed from hysterical neurosis. The aim of this follow-up study was to evaluate to which extent anxiety neurosis and obsessive-compulsive neurosis when compared with hysterical neurosis co-existed with depression, both at the level of diagnostic behaviour, including committed suicide, and with regard to symptom profile.

MATERIAL AND METHODS: A total of 112 patients were followed on the Danish Central Psychiatric Research Register and the Danish Cause of Death Register with regard to their diagnostic behaviour. In a subset of the sample (n = 24), the patients were assessed using the Hopkins Symptom Checklist (SCL)-90.

RESULTS: Both at the diagnostic level, including suicide rate, and at the level of symptom severity (SCL-90), anxiety neurosis and obsessive-compulsive neurosis were similar, in contrast to hysterical neurosis which had no more association with the other two categories of neurosis than would be expected by chance.

CONCLUSION: Anxiety neurosis and obsessive-compulsive neurosis are more severe disorders than hysterical neurosis, both in terms of symptom profile and depression, including suicidal behaviour. The identified suicides were committed within the first two decades after discharge from the index hospitalisation.

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In 1965, Erling Jacobsen (1919-1988) defended his doctoral thesis on neurosis at the University of Copenhagen in Denmark [1]. He was testing the hypothesis that in contrast to the other categories of neurosis (obsessive-compulsive and hysterical), patients with anxiety neurosis suffer from eridophobia, i.e. marked fear or anxiety about situations in which feelings of aggression or hostility are triggered, or avoidance of such situations. However, he was unable to confirm this hypothesis [1]. Anti-aggressive behaviour was seen in both anxiety neurosis and obsessive-compulsive neurosis [2].

With the advent of the Diagnostic and Statistical Manual of Mental Disorders (DSM)-III in 1980 [3], the term neurosis was eliminated because it was found that neurosis was mainly used for non-psychotic disorders, i.e. as an exclusion criterion for the presence of psychotic disorder. In the beginning of the 1980s, Jacobsen asked us to perform a follow-up on his original sample of patients in order to investigate the stability of the diagnoses and establish their predictive validity regarding morbidity and mortality [4]. We have previously published a description (in Danish) of our 50-year follow-up results based on data from the Danish registers [5]. However, the register-based data do not contain information regarding psychopathological symptoms. Thus, in the present analysis, we aimed at investigating the long-term predictive validity of the three neurosis diagnoses assigned by Jacobsen, using both longitudinal register data regarding suicide/diagnostic conversion, and recent self-ratings on the Hopkins Symptom Checklist (SCL)-90 [6]. Specifically, we aimed at answering the following research questions:

1. Is the concordance between the original categories of neurosis and the equivalent DSM-III categories adequate?
2. Will some patients initially diagnosed with a neurotic disorder develop depression as a coexistent state?
3. Will some patients initially diagnosed with a neurotic disorder develop a co-morbid disorder such as schizophrenia or dementia (i.e. multiple diagnoses)?
4. Does the suicide rate observed over the follow-up period differ between the three types of neurotic disorders (anxiety, obsessive-compulsive, hysterical) and from the suicide rate in the background population?
5. Does the total score on the SCL-90 and the Anxiety/neurosis subscale of the SCL-90 (SCL-ASS) differ from those of the background population at the 50-year follow-up?

MATERIAL AND METHODS

The original sample of patients included in the study by Jacobsen [1, 5] consisted of 30 males and 82 females who had been inpatients at a hospital for neurotic dis-

ORIGINAL ARTICLE

- 1) Psychiatric Central Referral Unit, Region of the Capital, Mental Health Services
- 2) Psychiatric Research Unit, Psychiatric Centre North Zealand, Hillerød
- 3) Psychiatric Practice, Hillerød
- 4) National Institute of Public Health, University of Southern Denmark, Copenhagen

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orders between 1952 and 1955. In total, 44 patients were classified as having anxiety neurosis, 34 patients as having obsessive-compulsive neurosis and 34 patients as having hysterical neurosis [1]. All patients were diagnosed in accordance with the Danish Psychiatric Association's Diagnostic System for Mental Disorders from 1952 [7].

In order to obtain permission to conduct the SCL-90 follow-up, we contacted the relevant Regional Ethical Committee (Zealand and Bornholm). The Ethical Committees considered our proposed follow-up a "pilot study", and allowed us to contact the patients by letter if we obtained approval to do so from their family doctors. Thus, only upon the family doctors' acceptance did we proceed to contact the patients by letter. In the spring of 1992, Birgitte Butler contacted and subsequently visited 24 patients who all completed the SCL-90. In the present analysis, we focused on the total score of the SCL-90 as an overall measure of psychopathology at follow-up, and on the eight-item SCL-ASS which covers symptoms of nervousness, worrying, suddenly being scared for no reason, spells of panic, obsessive thoughts, repeated behaviour, simple phobia and social phobia [8]. In a recent study based on a large sample of day-patients from a Danish psychiatric hospital, we demonstrated that the SCL-ASS is a psychometrically valid measure for the severity of anxiety/neurosis [9].

Below, the methodology for each specific research question is explained in further detail:

Research question 1: concordance between the 1952 diagnoses of neurosis and DSM-III

We had access to the patient records and were able to translate the original neurosis diagnoses into DSM-III diagnoses using the modified Multi-axial Classification of Depression (MUTICLAD) system [10]. In order to compare the concordance between the original diagnoses of anxiety neurosis, obsessive-compulsive neurosis and hysterical neurosis with the corresponding DSM-III diagnoses (panic disorder/generalised anxiety disorder (GAD), obsessive compulsive disorder (OCD) and conversion disorder respectively), we used Cramér's V coefficient [11].

Research question 2: coexistence with depression

In this part of the study regarding change to other categories, we used data from the Danish Psychiatric Central Register [12, 13]; we followed the patients until 31 December, 2000 [5]. Until 1994, the Danish Psychiatric Central Register used the International Classification of Diseases (ICD)-8 diagnostic system (WHO 1967). In 1994, the ICD-10 diagnostic system (WHO 1993) was implemented, but all our patients have been classified in accordance with ICD-8 as none of our patients appeared in the Dan-

ish Psychiatric Central Register during the last five years of our follow-up period from 1994 to 2000. In the ICD-8 classification, depressive episodes were categorised as being either endogenous (296.29) or non-endogenous (298.09). We focussed on the coexistence of the patients with more severe degrees of depression, using the term coexistence as proposed by Guze [14] when two clinical syndromes are present within the same illness. Thus, coexistence is interpreted according to Guze [14] as homogeneous syndromes in the sense that they refer to a single disorder with a coherent aetiology.

Research question 3: co-morbidity with schizophrenia or dementia

To evaluate co-morbidity between the neurotic disorders and the ICD-8 categories of 295 (schizophrenia) and 290-294 (organic mental disorders), we again used data from the Danish Psychiatric Central Register. The term co-morbidity is used in accordance with Guze [14] when referring to two or more quite different illnesses.

Research question 4: prediction of suicide

Concerning death by suicide, we followed the patients until 31 December 2004 [5] by means of the Danish Register of Causes of Death [15]. Potential excess mortality due to suicide among the neurosis patients was examined by calculating the ratio between the observed number of suicides and the expected number (standardised mortality ratio (SMR)).

Research questions 5: predictive syndromatic validity

The SCL-90 total score and the SCL-ASS score of the neurosis patients were compared against corresponding values for the Danish general population [16].

Ethics

The study was approved by the Danish Civil Registration System, the Danish Psychiatric Central Research Register and the Danish Data Protection Agency.

Trial registration: not relevant.

RESULTS

The patients were born between 1918 and 1938. Their median age was 31 when they were treated at the hospital for neurotic patients between 1952 and 1957 [5].

Concerning research question 1, **Table 1** shows the association between the original categories of neurosis according to the Danish Psychiatric Association's diagnostic system and the corresponding DSM-III diagnoses.

The Cramér V coefficient was 0.74 ($p < 0.01$), indicating an acceptable concordance (research question 1). On this background, further analyses were performed using the original categories of neurosis.

Table 1 shows the concordance between the original categories of neurosis and the corresponding DSM-III diagnoses for the 24 patients who completed the SCL-90. The Cramér V coefficient was 0.70 ($p < 0.01$)

Concerning research question 2, **Table 2** shows the 50-year follow-up for identification of patients who developed coexistence with depression. In total, six members of the group of patients with anxiety neurosis developed depression. In the two other groups, two patients in each group developed depression. Numerically, therefore, the group of anxiety neurosis had a closer coexistence with depression.

Concerning research question 3 for identification of patients who developed co-morbidity with schizophrenia and dementia, Table 2 shows that only patients with obsessive-compulsive neurosis developed co-morbidity with schizophrenia. Rather few patients developed co-morbidity with dementia.

Concerning research question 4, the prediction of suicide, **Table 3** shows that for both obsessive-compulsive neurosis and anxiety neurosis, the range of SMR for suicide was from over 1 to 18 ($p < 0.05$), whereas in hysterical neurosis the results ranged from 0.1 to 14.7, which is identical to the levels encountered in the general population. The suicides were committed during the first two decades of the follow-up period.

Table 4 shows the results related to the final research question. Once again, the patients in the hysterical neurosis group scored similarly to the general Danish population, especially on the SCL-ASS. The hysterical neurosis group of patients only scored higher than the general population on the somatisation subscale, but scores were lower than those of both obsessive-compulsive neurosis and anxiety neurosis. In all comparisons (Table 4), obsessive-compulsive neurosis scored highest, but anxiety neurosis followed closely as reflected by the total SCL-90 scores.

DISCUSSION

We found an acceptable concordance between Jacobson's original diagnosis of the three categories of neurosis and the corresponding DSM-III diagnoses (the first research question), which justifies that focus was solely on the original diagnoses of neurosis in this analysis of the follow-up results. Concerning our second question, it seemed that the coexistence between neurosis and depression was most pronounced for anxiety neurosis, which indicates that the patients have been suffering from the same kind of illness. However, for the fourth research question concerning the prediction of suicide, there was a statistically significant coexistence with both anxiety neurosis and obsessive-compulsive neurosis. In this context, the final research questions are of importance because unlike hysterical neurosis, both obsessive-

TABLE 1

The concordance between the original diagnosis of neurosis and the DSM-III categories. The values are n (%).

DSM-III, 1980, corresponding diagnoses	The Danish Psychiatric Association, Diagnostic System for Mental Disorders, 1952		
	anxiety neurosis	obsessive-compulsive neurosis	hysterical neurosis
<i>Overall (N = 112)</i>			
Panic/GAD	33 (75.0)	5 (14.7)	7 (20.6)
OCD	1 (2.3)	25 (73.5)	0 (0.0)
Conversion	0 (0.0)	0 (0.0)	19 (55.9)
Dysthymia	4 (9.1)	1 (2.9)	1 (2.9)
Other diagnoses	6 (13.6)	3 (8.8)	7 (20.6)
Total	44 (100.0)	34 (100.0)	34 (100.0)
<i>Subgroup who completed the SCL-90 (N = 24)</i>			
Panic/GAD	5 (62.5)	1 (14.3)	2 (22.2)
OCD	1 (12.5)	5 (71.4)	0 (0.0)
Conversion	0 (0.0)	0 (0.0)	5 (55.5)
Dysthymia	1 (12.5)	1 (14.3)	0 (0.0)
Other diagnoses	1 (12.5)	0 (0.0)	2 (22.2)
Total	8 (100)	7 (100)	9 (100)

DSM-III = Diagnostic and Statistical Manual of Mental Disorders, 3rd ed.; GAD = generalised anxiety disorder; OCD = obsessive compulsive disorder; SCL = Hopkins Symptom Checklist.

TABLE 2

The 50-year follow-up for identification of patients who developed ICD-8 categories (coexistence with depression or co-morbidity with schizophrenia or dementia). The values are n.

Final ICD-8 categories	The Danish Psychiatric Association, Diagnostic System for Mental Disorders, 1952		
	anxiety neurosis	obsessive-compulsive neurosis	hysterical neurosis
<i>Coexistence with depression</i>			
Endogen (296)	4	2	2
Non-endogen (298)	2	0	0
<i>Co-morbidity with schizophrenia (295)</i>			
Paranoides	0	1	0
Pseudoneurotica	0	1	0
Uncertain	0	1	0
<i>Co-morbidity with dementia (291-294)</i>			
Total	6	7	3

ICD-8 = International Classification of Disease, 8th version.

TABLE 3

The distribution of committed suicides over the 50-year follow-up.

Standardised mortality ratios due to suicide	The Danish Psychiatric Association, Diagnostic system for mental disorders, 1952		
	anxiety neurosis (n = 44)	obsessivecompulsive neurosis (n = 34)	hysterical neurosis (n = 34)
Standardised mortality ratio (95% confidence interval)	7.2 (2.0-18.5)	6.2 (1.3-18.0)	2.6 (0.1-14.7)

TABLE 4

The distribution of the HSCL-90 subscales (N = 24) mean (\pm standard deviation). Compared to [16].

HSCL-90 subscales	The Danish Psychiatric Association's Diagnostic System for Mental Disorders, 1952				p-value
	anxiety (n = 8)	OCD (n = 7)	hysteria (n = 9)	General population normal (n = 1.153)	
HAM-D ₁₆	0.91 (\pm 0.42)	1.48 (\pm 1.28)	0.80 (\pm 0.35)	0.68 (\pm 0.62)	0.02
HAM-D ₆	1.04 (\pm 0.67)	1.38 (\pm 1.46)	0.85 (\pm 0.46)	0.76 (\pm 0.76)	> 0.10
HAM-D ₉	0.81 (\pm 0.53)	1.59 (\pm 1.19)	0.79 (\pm 0.42)	0.66 (\pm 0.61)	0.01
HAM-D _{suicide}	1.12 (\pm 1.25)	1.14 (\pm 1.35)	0.56 (\pm 0.88)	0.45 (\pm 0.84)	0.09
HAM-A ₁₄	1.02 (\pm 0.50)	1.40 (\pm 1.11)	0.72 (\pm 0.24)	0.58 (\pm 0.55)	0.001
HAM-A ₆	1.31 (\pm 0.92)	1.52 (\pm 1.23)	0.91 (\pm 0.34)	0.75 (\pm 0.66)	0.02
SCL-ASS	1.03 (\pm 0.63)	1.55 (\pm 1.22)	0.44 (\pm 0.28)	0.42 (\pm 0.47)	< 0.001
Interpersonal sensitivity	0.97 (\pm 0.59)	1.63 (\pm 1.14)	0.71 (\pm 0.58)	0.84 (\pm 0.70)	> 0.10
Somatization subscale	1.22 (\pm 0.70)	1.26 (\pm 1.04)	0.87 (\pm 0.54)	0.49 (\pm 0.53)	0.001
Total HSCL-90	0.85 (\pm 0.37)	1.21 (\pm 0.94)	0.56 (\pm 0.23)	0.45 (\pm 0.43)	0.001

HAM-A₆ = Hamilton Anxiety Scale, core items; HAM-A₁₄ = Hamilton Anxiety Scale, full scale; HAM-D₆ = Hamilton Depression Scale, core items; HAM-D₉ = Hamilton Depression Scale, arousal items; HAM-D₁₆ = Hamilton Depression Scale, full scale; HAM-D_{suicide} = Hamilton Depression Scale, suicide item; HSCL-90 = Hopkins Symptom Checklist, full scale; OCD = obsessive compulsive disorder; SCL-ASS = Hopkins Symptom Checklist anxiety subscale.

compulsive neurosis and anxiety neurosis scored higher than the general population on the SCL-90.

Thus anxiety neurosis and obsessive-compulsive neurosis have a common factor of severity when compared with hysterical neurosis. This conclusion is in accordance with the original works by Freud and Janet. In his original description of the clinical symptomatology of "Die gemischte Neurose", Freud [17] stated that we have to distinguish the mixed neurosis from those symptoms which belong neither to neurasthenia nor to hysteria.

The mixed neurosis goes from anxiety neurosis, including anxiety attacks, to phobias and obsessional thoughts [17]. The mixed neurosis was found to have no more association with hysteria than would be expected by chance [18].

When Jacobsen asked us to perform a follow-up on the patients he so intensively investigated in the 1950s, it was his impression from his later clinical work, especially with patients he treated with antidepressants, that

anxiety neurosis coexisted with depression. He was aware of the work by Hoch and Polatin [19] describing how patients with neurotic symptoms might develop schizophrenia-like symptoms, which, however, were often different from the classic types of schizophrenia. In our follow-up analysis, three patients developed symptoms within the schizophrenic spectrum; all were from the original group of obsessive-compulsive neurosis. These three patients were actually also classified by the DSM-III as having obsessive-compulsive disorders. Obsessive symptoms may occur in schizophrenia, but are here of a rather bizarre form [20]. As discussed by Guze [14], co-morbid illnesses such as obsessive-compulsive neurosis and schizophrenia are very important to identify because treatment with antidepressants may adversely affect the outcome in schizophrenia. In other words, it is two different kinds of illnesses. On the other hand, the coexistence of anxiety neurosis with depression refers to the same underlying illness which implies that the therapeutic approach is quite similar.

In general, however, we found the consistency of the original neurotic categories (anxiety, obsessive-compulsive and hysteria) to be very high over the 50 years of follow-up. We found no superiority of the corresponding DSM-III categories over the original neurotic categories. In the very few cases in which obsessive-compulsive neurosis was co-morbid with schizophrenia, the diagnostic hierarchies in the ICD-8 would force the diagnostician to use only one category: schizophrenia. Within the neurotic disorders, we found that the anxiety and obsessive-compulsive categories have no higher association with hysteria than would have been expected by chance in terms of depression or suicidal behaviour. In these cases, coexistence between anxiety and depression should be considered rather than co-morbidity.

The Danish psychiatrist Erling Jacobsen. Drawing by Torben Bendix, 1982.



CORRESPONDENCE: *Per Bech*, Voksenpsykiatrisk Afsnit, Psykiatrisk Center Nordsjælland, Hillerød, Dyrehavevej 48, 3400 Hillerød, Denmark.
E-mail: per.bech@regionh.dk

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