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Testing the Comparability of Psychiatric Diagnoses in ICD-10 and DSM-III-R

Abstract

The compatibility of the classification systems ICD-10 and DSM-III-R was investigated in a sample of 100 psychiatric inpatients with severe affective and psychotic disorders. Four independent raters assessed diagnoses by means of checklists from psychopathological descriptions of case records. Congruence between ICD-10 and DSM-III-R was good for depressive disorders with agreement rates above 80% and fair for bipolar disorders with rates above 60%. Less consistent findings were obtained for schizophrenia with rates of 57.5% for ICD-10 diagnoses and 82.6% for DSM-III-R diagnoses. Agreement for schizoaffective disorder was below 40% and thus insufficient. The results indicate that even small differences in the definitions of mental disorders may result in considerable inconsistencies.

Introduction

New definitions of psychiatric disorders and new diagnostic principles are introduced by ICD-10, the tenth edition of the International Classification of Diseases [1, 2]. This system provides explicit diagnostic criteria which define typical signs and symptoms, age of onset, characteristics of course, psychoso-

cial impairments and grades of severity. Together with diagnostic decision rules (algorithms), such diagnostic criteria have been proposed to increase the objectivity and reliability of diagnoses. ICD-10 has adopted the concept of so-called operationalized diagnoses from the American classification systems DSM-III and DSM-III-R [3]. A high level of acceptance and endorsement was found

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among clinicians and researchers in different countries in an international questionnaire survey for DSM-III/DSM-III-R [4] and in first field trials for ICD-10 [5-7].

The approach of both classification systems is theoretically neutral and the importance of an empirical foundation of diagnostic categories is emphasized [8-10]. Other characteristics common to both systems are: (a) most disorders are defined primarily by descriptive criteria and not by etiological assumptions; (b) similarities of symptomatology are the major criteria for classification and subclassification; (c) the traditional but controversial etiological distinction between psychosis and neurosis is given up; (d) mental disorders and associated conditions such as somatic diseases or psychosocial functioning are differentiated by a multiaxial form; (e) the principle of comorbidity (multiple diagnoses for single patients) instead of hierarchical classification is recommended.

Despite a generally high degree of compatibility, the definitions of individual disorders and their delineation from each other are *not* completely identical in both systems [10, 11]. Examples are the minimum duration criteria for schizophrenia, which are 6 months in DSM-III-R and only 1 month in ICD-10. Differences also exist for the definition of schizoaffective disorder for which ICD-10 does not require a distinct psychotic episode without prominent affective symptoms (as does DSM-III-R). In the section of affective disorders, DSM-III-R requires 5 out of 9 depressive symptoms for a major depressive syndrome and 3 out of 7 manic symptoms for a manic syndrome. In contrast, 10 depressive and 9 manic symptoms are listed in ICD-10, of which at least 4 have to be present for a depressive and at least three for a manic episode. Such inconsistencies might be considered to be of minor importance; however, it is unknown to which extent equivalent diag-

noses in both classification systems are in fact comparable when patients are examined and diagnosed in typical clinical settings.

The present study was conducted to evaluate the compatibility of ICD-10 and DSM-III-R by comparing major diagnoses of both systems for the same diagnosticians and the same set of patients. We applied the diagnostic criteria of ICD-10 and DSM-III-R simultaneously to 100 case records which were derived from routine clinical case histories of a psychiatric hospital. These patients had been investigated during the Munich Follow-Up Study [12] where all of them had received a definite or probable clinical diagnosis of an endogenous psychosis. For the purpose of the present study, all case records were again read and evaluated by 4 independent diagnosticians. The following questions were addressed by our study: (1) To what degree are equivalent diagnoses in ICD-10 and DSM-III-R comparable when applied to typical psychiatric case histories? (2) Which incompatibilities are common between the two classification systems and what is their clinical relevance? (3) How similar are specific categories in ICD-10 and DSM-III-R when they are compared between raters (interrater comparison) and within raters (intrarater comparison)?

Material and Methods

Selection and Preparation of Case Records. The material of this study consisted of 100 written case records referring to patients who had been examined and treated as psychiatric inpatients in the former Psychiatric Department of the Max Planck Institute of Psychiatry in Munich (FRG) between 1973 and 1975. All patients had also been examined as part of the Munich Follow-Up Study [12]. The original selection criteria had been: (a) definite or probable clinical diagnosis according to the former ICD-8 system; (b) age between 20 and 65 years; (c) IQ of 85 or above; (d) length of inpatient treatment at least 10 days. The subsample of patients with the clinical diagnosis of an endogenous psychosis according to ICD-8 was used for

the present study. We included only those patients who had been followed up 6–8 years after index admission and who had additionally received a clinical diagnosis of a specific disorder according to DSM-III (given by a different diagnostician on the basis of case history data) [13]. The raters of the present study were kept blind to all previous clinical and DSM-III diagnoses.

The case records were written in a traditional, standard form and generally consisted of 4–9 pages. They referred to the psychiatric symptomatology at admission and during hospitalization (mental status examination), mental disorders in family members, former psychiatric disturbances and other medical diseases of the patients. However, other biographical data and any mention of a present or past psychiatric diagnosis were omitted before the case reports were distributed to the participating diagnosticians. We chose this procedure because diagnoses were to be derived directly from the psychopathological descriptions in the case records and should not be influenced by previous nosological considerations.

Diagnostic Assessment. Copies of all 100 case records were independently given to each of the 4 clinicians. They were asked to read the records carefully and to work out diagnoses according to ICD-10 as well as DSM-III-R. The diagnosticians were 2 psychiatrists and 2 clinical psychologists (each 1 male and 1 female) with 2–3 years' clinical psychiatric experience. They had received their training in different psychiatric facilities or different departments of the Max Planck Institute of Psychiatry. All patients described in the case reports were unknown to them (time elapsed from first admission to our evaluation procedure had been 12–15 years).

Diagnostic assessment was done by means of the International Diagnostic Checklists (IDCL) which exist in separate versions for ICD-10 and DSM-III-R. This instrument was developed by us to serve as a guideline for clinicians and researchers when patients are to be examined according to the specific descriptions and criteria of both classification systems. The IDCL are associated with the family of instruments provided by the WHO for diagnostics according to ICD-10 [14]. The checklists have first been introduced under the label 'Munich Diagnostic Checklists' [15, 16].

The ICD-10 lists employed in this study referred to the 1990 draft of the diagnostic criteria for research [1]. All diagnosticians were sufficiently experienced with the use of the instrument and with the contents and concepts of ICD-10 and DSM-III-R. They were instructed not to simply confirm their diagnostic impressions but to check diagnostic criteria carefully and

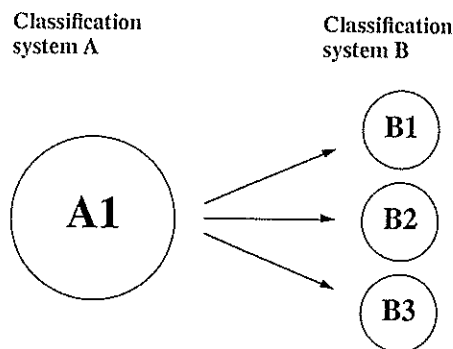


Fig. 1. Comparison of diagnostic categories in two classification systems

to make a specific diagnosis only if all relevant criteria were judged to be fulfilled. ICD-10 and DSM-III-R were to be considered as independent classification systems, including the logical possibility to diagnose two different disorders whenever criteria for the same disorders differed between the systems. None of the clinicians knew the diagnoses given by his colleagues when evaluating a specific case record and it was agreed to avoid any communication about individual cases until the judgement procedures were completed.

Patient Characteristics. 47 of the patients were male, 53 female. The mean age (at first admission) was 39.2 years (SD = 9.44 years) with a range from 25 to 62 years. Familial status was 47 single, 38 married, 14 divorced or separated, and 1 widowed. The educational level of the patients varied between primary school and high school. 33 patients had attended school for 8–9 years, 35 for 10 years, 5 for 12 years, 26 for 13 years and 1 for less than 8 years.

Statistical Analyses. We used percentage rates to compare the degree of congruence between categories in ICD-10 and DSM-III-R. Due to incompatibilities in the definitions of individual disorders, patients with identical diagnoses in one classification system may receive different diagnoses in the other system. This is illustrated in figure 1 where a unique category of system A (A_1) diverges or 'splits up' into three different categories of system B (B_1 , B_2 and B_3). In this case, sample proportions for the three categories in B would be computed. If each patient is described by only one diagnosis in each classification system, the percentage

Table 1. Frequencies and reliabilities for diagnostic categories in ICD-10 and DSM-III-R

	Sample frequencies, %		Reliability, κ	
	ICD-10	DSM-III-R	ICD-10	DSM-III-R
Schizophrenia	43.50	30.25	0.65	0.51
Schizophreniform/acute and transient psychotic disorder	4.00	12.50	0.74	0.50
Schizoaffective disorder	11.75	6.25	0.24	0.08
Major depression/depressive disorder	22.00	23.25	0.82	0.80
Bipolar disorder	8.50	9.25	0.53	0.65
All disorders	—	—	0.59	0.53

rates for the different categories in B sum up to 100% (i.e. $B_1 + B_2 + B_3 = 100\%$).

It should be pointed out that the use of percentage rates in this case is equivalent to the use of conditional probabilities. For example, if 50% of the patients with diagnosis A_1 in figure 1 were classified as B_1 in the other system, a conditional probability of $p[B_1/A_1] = 0.50$ would result. This means that the probability for each patient to be diagnosed by B_1 is 0.50, given that the patient comes from the subsample of category A_1 .

In addition to percentage agreements between categories in ICD-10 and DSM-III-R, we report reliabilities for the individual disorders by means of κ where agreement expected by chance alone is taken into account. We employed a procedure introduced by Fleiss [17] to analyze diagnoses of multiple raters for the same set of cases.

Results

Sample frequencies and interrater reliabilities for the individual diagnoses according to ICD-10 and DSM-III-R are shown in table 1. We found that reliability was superior in ICD-10 for all main disorders except for bipolar disorder. Diagnostic agreement was generally excellent for depressive disorders (with κ of 0.80 and above) and moderate for bipolar disorder, schizophrenia and schizophreniform/acute and transient psychotic disorder (with κ

of 0.50 and above). However, insufficient interrater agreement was found for schizoaffective disorder in both classification systems with low κ values of 0.08 in DSM-III-R and 0.24 in ICD-10. It can be seen from table 1 that schizophrenia was diagnosed more often in ICD-10 (43.5%, as compared to 30.25% in DSM-III-R), but the sample rate of schizophreniform/acute and transient psychotic disorder was higher in DSM-III-R (12.5%, as compared to 4.0% in ICD-10). This difference was mainly due to the different duration criteria of schizophrenia of 1 month in ICD-10 and 6 months in DSM-III-R.

We analyzed the interrelationship between ICD-10 and DSM-III-R by contrasting each single diagnosis in one system with all diagnoses made for the same case in the other system. For example, whenever clinician A had diagnosed schizophrenia according to ICD-10 for a single patient, this diagnosis was compared with all four DSM-III-R diagnoses the same patient had received. These four diagnoses included the three DSM-III-R diagnoses made by his three colleagues B, C and D as well as the DSM-III-R diagnosis given by A himself. A total of 1,600 pairwise comparisons resulted from this method, since each

Fig. 2. Schizophrenia according to ICD-10 and the classification of these patients in DSM-III-R.

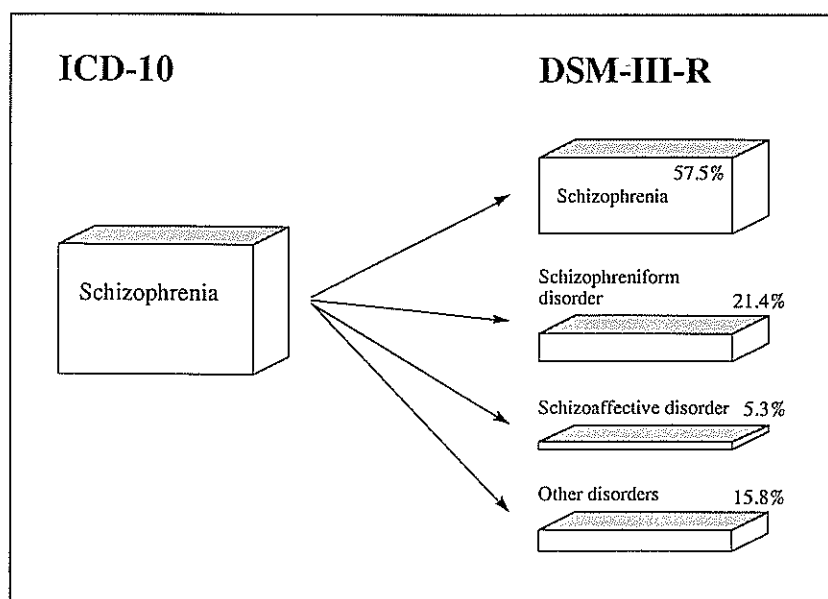
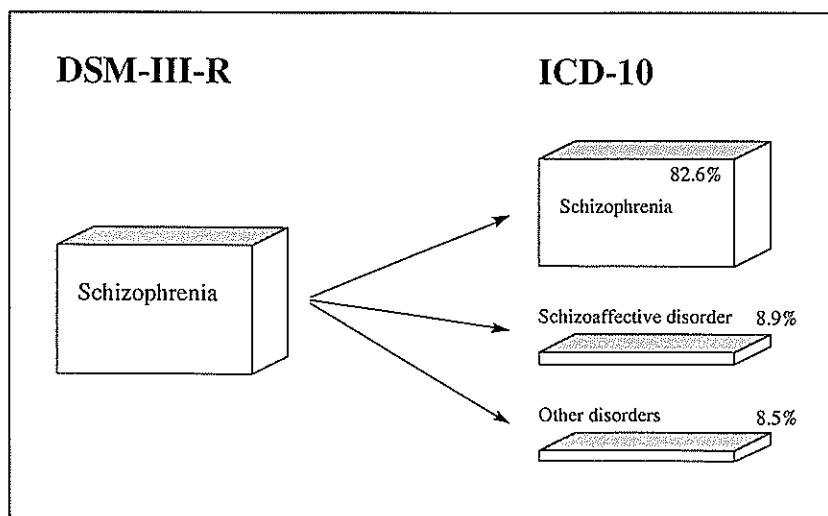


Fig. 3. Schizophrenia according to DSM-III-R and the classification of these patients in ICD-10.



diagnosis in one system was compared with four diagnoses in the other system ($4 \times 100 = 400$ comparisons) and this was done for all 4 diagnosticians ($4 \times 400 = 1,600$ comparisons).

Results of this analysis are illustrated in figures 2 and 3 for the category of schizophrenia. When diagnosed according to ICD-10 (fig. 2), schizophrenia was confirmed in 57.5% by the equivalent diagnosis according to DSM-III-R and disconfirmed in the remaining 42.5%. These 42.5% were split up

into schizophreniform disorder (21.4%), schizoaffective disorder (5.3%) and other disorders (15.8%). Figure 3 shows that a more homogeneous situation was found for schizophrenia according to DSM-III-R. This diagnosis was confirmed in 82.6% (i.e., the same disorder was congruently diagnosed according to ICD-10) and disconfirmed in only 17.4%. The most frequent discrepancy was due to schizoaffective disorder with a proportion of 8.9%. A comparison of figures 2 and 3 shows that both distributions were similar if

Table 2. Interrater comparisons between diagnoses in DSM-III-R and ICD-10

ICD-10	DSM-III-R						Total
	schizophrenia	schizophreni- form disorder	schizoaffective disorder	major depression	bipolar disorder	other disorders	
Schizophrenia	400 (82.6; 57.5)	149 (74.5; 21.4)	37 (37.0; 5.3)	3 (0.8; 0.4)	9 (6.1; 1.3)	98 (33.1; 14.1)	696 (43.5)
Acute/transient psychotic disorder	2 (0.4; 3.1)	27 (13.5; 42.2)	3 (3.0; 4.7)	0 (0; 0)	0 (0; 0)	32 (10.8; 50.0)	64 (4.0)
Schizoaffective disorder	43 (8.9; 22.9)	21 (10.5; 11.2)	40 (40.0; 21.3)	34 (9.1; 18.1)	40 (27.0; 21.3)	10 (3.4; 5.3)	188 (11.75)
Depressive disorder	3 (0.6; 0.9)	0 (0; 0)	4 (4.0; 1.1)	308 (82.8; 87.5)	1 (0.7; 0.3)	36 (12.2; 10.2)	352 (22.0)
Bipolar disorder	4 (0.8; 2.9)	0 (0; 0)	10 (10.0; 7.4)	6 (1.6; 4.4)	93 (62.8; 68.4)	23 (7.8; 16.9)	136 (8.5)
Other disorders	32 (6.6; 19.5)	3 (1.5; 1.8)	6 (6.0; 3.7)	21 (5.6; 12.8)	5 (3.4; 3.0)	97 (32.8; 59.1)	164 (10.25)
Total	484 (30.25)	200 (12.5)	100 (6.25)	372 (23.25)	148 (9.25)	296 (18.5)	1,600

Absolute values are given for each cell with column percents (left) and row percents (right) in parentheses.

discrepancies in figure 2 due to schizophreniform disorders were considered to be in agreement with schizophrenia. On this assumption, almost 80% of all schizophrenia diagnoses would be confirmed by identical diagnosis in the other system.

The complete results for all main disorders of our study are presented in table 2 (a graphical presentation for each disorder as in fig. 2 and 3 would exceed the limited space of this article). Congruence between ICD-10 and DSM-III-R was good for depressive disorders (87.5 and 82.8%) and fair for bipolar disorder (68.4 and 62.8%). The lower values for bipolar disorder were mainly due to insufficient boundaries between bipolar and schizoaffective disorder. In our sample, 27.0% of the

bipolar disorders in DSM-III-R were rated as schizoaffective in ICD-10 and 21.3% of the schizoaffective disorders in ICD-10 were rated as bipolar in DSM-III-R. However, bipolar disorder was well discriminated from schizophrenia and depressive disorders. Among bipolar disorders in ICD-10, only 2.9% were diagnosed in DSM-III-R as schizophrenic and 4.4% as depressive, and among bipolar disorders in DSM-III-R, 6.1% were diagnosed in ICD-10 as schizophrenic and 0.7% as depressive.

The lowest degree of congruence was obtained for schizoaffective disorder in both classification systems. Whenever this disorder was diagnosed according to ICD-10, a variety of diagnoses other than schizoaffective

Table 3. Intrarater comparisons between diagnoses in DSM-III-R and ICD-10

ICD-10	DSM-III-R						Total
	schizophrenia	schizophreniform disorder	schizoaffective disorder	major depression	bipolar disorder	other disorders	
Schizophrenia	114 (94.2; 65.5)	38 (76.0; 21.8)	3 (12.0; 1.7)	0 (0; 0)	0 (0; 0)	19 (25.7; 10.9)	174 (43.5)
Acute/transient psychotic disorder	0 (0; 0)	8 (16.0; 50.0)	0 (0; 0)	0 (0; 0)	0 (0; 0)	8 (10.8; 50.0)	16 (4.0)
Schizoaffective disorder	3 (2.5; 6.4)	3 (6.0; 6.4)	21 (84.0; 44.7)	8 (8.6; 17.0)	10 (27.0; 21.3)	2 (2.7; 4.3)	47 (11.75)
Depressive disorder	0 (0; 0)	0 (0; 0)	0 (0; 0)	84 (90.3; 95.5)	0 (0; 0)	4 (5.4; 4.5)	88 (22.0)
Bipolar disorder	0 (0; 0)	0 (0; 0)	1 (4.0; 2.9)	0 (0; 0)	27 (73.0; 79.4)	6 (8.1; 17.6)	34 (8.5)
Other disorders	4 (3.3; 9.8)	1 (2.0; 2.4)	0 (0; 0)	1 (1.1; 2.4)	0 (0; 0)	35 (47.3; 85.4)	41 (10.25)
Total	121 (30.25)	50 (12.5)	25 (6.25)	93 (23.25)	37 (9.25)	74 (18.5)	400

Absolute values are given for each cell with column percents (left) and row percents (right) in parentheses.

tive disorder were made according to DSM-III-R. Table 2 shows that only 21.3% of schizoaffective disorders in ICD-10 were confirmed in DSM-III-R, but considerable discrepancy rates were found due to schizophrenia (22.9%), bipolar disorder (21.3%) and major depression (18.1%). The confirmation rate of schizoaffective disorder in DSM-III-R was 40.0%, but disagreement with the ICD-10 category of schizophrenia was high with a proportion of 37.0%.

We wish to emphasize that all discrepancies considered so far are not only due to different definitions in ICD-10 and DSM-III-R, but also reflect the varying degrees of reliability for the individual diagnoses as shown in table 1. Schizoaffective disorder, for example,

was the least reliable diagnosis in our study (in both systems), and we consequently found the most heterogeneous distributions for this diagnosis when both classifications were contrasted. However, this situation must be expected in everyday clinical practice when patients are more or less reliably examined and diagnosed by different clinicians.

The problem of reliability is ignored if diagnoses between ICD-10 and DSM-III-R are compared *within* each individual diagnostician (i.e. intrarater comparison), rather than *between* diagnosticians (i.e. interrater comparison). Table 3 shows the results of the intrarater analysis for the present study, based on a total of 400 comparisons (100 comparisons for each of the four diagnosticians).

As expected, agreement for identical diagnoses in ICD-10 and DSM-III-R is clearly higher in table 3 than for the interrater comparisons of table 2. We computed congruence rates of 95.5 and 90.3% for major depression/depressive disorder and of 79.4 and 73.0% for bipolar disorder. However, even 8.6% of patients with major depression and 27.0% of patients with bipolar disorder according to DSM-III-R were diagnosed as schizoaffective according to ICD-10. This disorder, in turn, was confirmed by the diagnosticians themselves in only 44.7% by applying the same diagnosis according to DSM-III-R, and a considerable divergence was found for bipolar disorder (21.3%), major depression (17.0%), schizophrenia and schizophreniform disorder (each 6.4%). Thus, schizoaffective disorder not only had poor reliabilities in this study, but it has also been considered by the diagnosticians themselves as ambiguously defined and insufficiently delineated from other disorders.

Discussion

Classification systems such as ICD-10 and DSM-III-R represent an international and widely accepted standard for the definition of psychiatric disorders. They are expected to facilitate communication between different clinicians in hospital and outpatient care by providing a common framework for the assessment of psychopathology and other diagnostic criteria. ICD-10 and DSM-III-R are very similar in their general concepts of schizophrenia and affective disorders. However, no unequivocal consensus exists about a number of details like the nature and number of symptoms which are required for specific diagnoses or the minimum duration of a symptomatology. More or less discrepant definitions become apparent when correspond-

ing diagnoses in both classifications are compared more closely, particularly with respect to schizoaffective disorders.

The present paper describes an empirical comparison of major psychiatric disorders which were assessed simultaneously according to ICD-10 and DSM-III-R. We analyzed checklist-guided diagnoses made by 4 independent clinicians for a set of 100 case records of psychiatric inpatients. Best equivalence was found for affective disorders with congruence rates of above 80% for depressive disorders and above 60% for bipolar disorders. The congruence for bipolar disorders was lower mainly because of unclear delineations between bipolar and schizoaffective disorder. Among bipolar disorders in ICD-10, 7.4% were diagnosed as schizoaffective in DSM-III-R; and among bipolar disorders in DSM-III-R, even 27.0% were diagnosed as schizoaffective in ICD-10.

We further observed clear discrepancies for schizophrenia and the shorter and less severe schizophreniform disorders (which are termed acute and transient psychotic disorders in ICD-10). While 82.6% of schizophrenia diagnoses in DSM-III-R were confirmed in ICD-10, the reverse confirmation rate was only 57.5%. The main reason for this discrepancy was found in the different duration criteria for schizophrenic symptoms of at least 6 months in DSM-III-R and only 1 month in ICD-10. Diagnoses of schizoaffective disorder were the least reliable ones in our study and the congruence rates between ICD-10 and DSM-III-R for this disorder were only 21.3 and 40.0%.

Evidence for incompatibilities between ICD-10 and DSM-III had also emerged in ICD-10 field trials in German-speaking countries [5-7, 10]. Both classification systems were compared in a sample of 17 patients for which 417 assessments of numerous clinicians were available. Maier et al. [10] reported

that 22 of 58 ICD-10 diagnoses of schizoaffective disorder (38%) were diagnosed as affective disorders in DSM-III. Higher rates were reported for schizophrenia (81 out of 86 ICD-10 diagnoses confirmed) and affective disorders (43 out of 43 ICD-10 diagnoses confirmed). However, only 43 of 68 diagnoses of affective disorders according to DSM-III (63%) were confirmed in ICD-10 with the differential diagnosis of schizoaffective disorder as the main source of incongruence (22 from 68 diagnoses = 32%). Schizophrenia according to DSM-III was equally diagnosed according to ICD-10 in 81 out of 85 cases. The diagnoses of this study were derived from the clinical descriptions and diagnostic guidelines of ICD-10 [2] and without the use of any diagnostic instrument.

To summarize, our results and those obtained in the ICD-10 field trials suggest that equal diagnostic terms used in ICD-10 and DSM-III-R turn out to refer to different phe-

nomena. Findings for patients who are classified according to one system should therefore only carefully be extended to patients classified according to the other system. Our data indicate that such generalizations should be avoided for schizophreniform and schizoaffective disorders. However, there is evidence that ICD-10 is well accepted by clinicians of different institutions [18, 19] and that reliabilities of ICD-10 diagnoses are comparable to those of DSM-III-R diagnoses [6, 11]. Further investigations should focus on the validity of disorders as defined by both systems and on a more definite delineation between the diagnostic categories.

Acknowledgements

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