Pilot Study of the Adjunct Utility of a Computer-Assisted Diagnostic Interview Schedule (C-DIS) in Forensic Psychiatric Patients

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To assess the potential usefulness of a structured and computer-assisted diagnostic interview under field conditions, menu-driven interviews with 18 of 20 probands undergoing forensic psychiatric examination were scored into axis I DSM-III diagnoses, independent of the regularly derived ICD-9 diagnoses. The computer-assisted interview yielded more affective and anxiety disorders than routine clinical procedures, many of which were amenable to treatment. The computer interview was acceptable to the probands. Controlled studies are suggested to assess the benefits of computer-assisted diagnosis in addition to traditional diagnostic procedures in forensic psychiatric patients.

To improve the quality of diagnosis for patients undergoing forensic psychiatric examination, structured interviews have been proposed.[1-5] Such procedures may also improve the quality of care by finding cases amenable to treatment.[6-8] Even small improvements can be cost effective because of the high cost of incarceration and community violence relating to mental disorders.[9] They may also make diag-

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nosing more stringent and enable a uniform legal process.[10]

The forensic psychiatric investigation for serious crimes in Sweden consists of a minimum of four weeks of observation, repeated interviews, conducted on a maximum security unit, an examination of prior medical and social records, and neuropsychological and personality tests. The psychiatrist derives International Classification of Diseases-Ninth Revision (ICD-9) diagnoses, and recommends that the court sentence to psychiatric treatment or to imprisonment.

The current pilot study was set up to test a computer-assisted structured diagnostic interview, used in addition to reg-

ular forensic examinations. Rather than doing a study of typical psychiatric outpatients or those in primary care, we chose this population for which diagnostic precision is of crucial importance to the patients' futures and to the credibility of the diagnosis.

We used the Diagnostic Interview Schedule (DIS), developed for the Epidemiologic Catchment Area study.[11] A computer-assisted version of the DIS (C-DIS) was translated into Swedish in collaboration with A. G. Blouin, Ottawa Civic Hospital (Ottawa, Canada).[12, 13] It probed 41 Axis I diagnoses and antisocial personality disorder in the DSM-III nosology, with the exception of posttraumatic stress disorder. The C-DIS has been used in studies of psychiatric and suicidal outpatients, incest victims, F-16 pilots, and war veterans.[14–18] A traditional DIS was used with prisoners.[6]

Computerized diagnostic interviews agree with traditional techniques.[13, 19, 20] Yet the Beck Depression Inventory was more sensitive than the C-DIS in detecting current major depression in women with fibromyalgia and in identifying depressed post-myocardial infarction patients with higher mortality rates.[21, 22] Combined with chart information on substance abusers, the C-DIS found twice as many diagnoses as did the Structured Clinical Interview for DSM-III-R (SCID).[23] These studies emphasize the need for more valid and reliable screening instruments as an adjunct to routine clinical diagnosis and observation.[24, 25]

The primary objective of this study was to determine whether systematic probing for self-perceived mental symptoms yielded more co-morbid conditions than the routine forensic diagnostic procedure based on history and clinical observation. As a secondary objective, we wanted an estimate, under field conditions, of the attitudes among probands and staff toward using a personal computer.

Materials and Methods

Among the clientele admitted for forensic psychiatric investigation in Stockholm between 1989 and 1992, a sample of 20 probands was asked to consent to the interview. The selection criteria were fluency in Swedish, ability to read and write, absence of severe mental retardation, and ability to give informed consent. All had been weaned off abusable substances at least one to two months before the interview, and access to such drugs within the unit was negligible. The crimes they had committed included first to third degree murder, arson, sexual assault, assault and battery, and one case of grand fraud. This was a typical spectrum of crimes among those referred to this unit.

The C-DIS was administered by a psychiatrist unrelated to the routine assessment and care of the patients (J.A.). The interviewer operated a portable computer to minimize wrongful data entry. Current (within 12 months) C-DIS diagnoses were recorded. Adjustments to the criteria for recent substance use disorders were made if the proband had spent long periods in custody. The patients' cooperativeness with the procedure was rated on a scale of 0 to 4, and the amount of time needed to complete the interview was recorded.

The C-DIS interviewer had no prior

association with the probands and was not informed of their diagnoses, charts, and crimes committed. The probands had nothing to gain or to lose by participating. The study was approved by the Research Ethics Review Committee of the Karolinska Institute and by the Data Inspection Board.

Results

Of the 20 probands who gave informed consent to the interview, 2 then withdrew. One had an ICD-9 antisocial personality disorder and the other, paranoid schizophrenia. All of those interviewed were male, 15 to 50 years old (mean age, 39 years). Two had low IQ scores (75 and 85). In most instances, the interview had to be divided into two to three sessions, involving an effective total of 58 to 285 minutes (mean, 131 minutes).

All except 1 of the 18 probands completed the interview by self-operating the personal computer, assisted by the interviewer. Twelve probands cooperated fully with the procedure (rated 4), four were semicooperative (rated 2 to 3), while four displayed hostility or a notable amount of uncooperativeness (rated 0 to 1). Two probands took repeated brief breaks. As a result of the routine examination, nine of the probands were subsequently recommended for psychiatric treatment by the court instead of imprisonment.

More diagnoses were derived with the C-DIS interview than with the routine examination (Table 1). The only personality disorder category in the C-DIS, antisocial personality disorder, was diagnosed in 7 of the probands, versus 15

diagnosed with any kind of personality disorder using the ICD-9. Anxiety disorders and phobias were picked up by the C-DIS in nine cases versus in only one with the ICD-9. An affective disorder was diagnosed in nine cases with C-DIS and three with ICD-9. Case 8, with an IQ of 75, had several symptoms, but no constellation that reached a diagnostic level in C-DIS.

Limiting the diagnoses to those most amenable to treatment with pharmacologic and/or specific psychological intervention (psychosis, anxiety disorders, and depression), the C-DIS identified 28 such conditions, versus the routine examination, which identified only 5 conditions.

Discussion

The principal finding of this pilot study was that a menu-driven and computer-assisted diagnostic interview yielded more self-reported current psychiatric diagnoses in forensic psychiatric patients than routine procedures did; most of these diagnoses are amenable to treatment. If these conditions can be confirmed clinically, and if patients can be persuaded to comply with appropriate medication and/or psychotherapy schedules, the procedure is of potential benefit for a low cost. The interview was acceptable to the probands with no obvious semantic glitches. The computer scoring of the diagnoses was expedient and did not require much time or training by the interviewer.

Detecting affective disorders by structured probing has the potential to reduce the suicide risk, shown to be two to three times increased in a study of mentally

Table 1
Current ICD-9 and DSM-III Diagnoses Derived with Routine Forensic Procedures and with the Computer-Assisted Structured Interview C-DIS Among 20 Male Forensic Psychiatric Patients

Case No.	Age, yr	Routine ICD-9 Diagnoses		C-DIS DSM-III Diagnoses	
1	30	301W	Schizoid and narcissistic personality disorder	300.02	Generalized anxiety disorder
				300.30	Obsessive compulsive disorder
2	20	301W	Immature personality disorder	301.70	Antisocial personality disorder
				303.93	Alcohol dependence
		303	Alcohol dependence	300.21	Agoraphobia with panic attacks
		304D, E	Cannabis + amphetamine dependence	305.00	Alcohol abuse
				300.22	Agoraphobia
				305.70	Amphetamine abuse
				304.40	Amphetamine dependence
3	25	300A	Anxiety neurosis	296.70	Atypical bipolar disorder
				301.70	Antisocial personality disorder
				296.33	Major recurrent depression
				300.29	Simple phobia
4	47	301W	Borderline and narcissistic personality disorder	300.81	Somatization disorder
				295.30	Paranoid schizophrenia
				296.35	Major recurrent depression
		303	Alcohol dependence	303.93	Alcohol dependence
				302.70	Psychosexual dysfunction
5	15	V70B	No psychiatric diagnosis	300.29	Simple phobia
				V62.82	Uncomplicated grief reaction
6	25	302	Pedophilia, exhibitionism	296.33	Major recurrent depression
		301X	Unspecified (borderline) personality disorder	302.00	Ego-dystonic homosexuality
				305.03	Alcohol abuse
7	39	301J	Borderline personality disorder	296.25	Major depression—single episode
				305.03	Alcohol abuse
				303.93	Alcohol dependence
8	23	312	Behavioral disorder (arson)		No diagnosis
		303	Alcohol abuse		
		317	Slight mental retardation		
		311	Unspecified depression		
9	30	301W	Immature personality disorder	296.35	Major recurrent depression
				300.22	Agoraphobia
				300.29	Simple phobia
10	17	312	Behavioral disorder	295.40	Schizophreniform disorder
				300.29	Simple phobia
				V62.82	Uncomplicated bereavement

Computer-Assisted Diagnosis

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Table 1
(continued)

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Case No.	Age, yr	Routine ICD-9 Diagnoses		C-DIS DSM-III Diagnoses	
11	28	301X	Unspecified personality disorder	300.02	Generalized anxiety disorder
				300.22	Agoraphobia
				296.35	Major recurrent depression
				300.29	Simple phobia
12	25	301H	Antisocial personality disorder	305.03	Alcohol abuse
				303.93	Alcohol dependence
				304.80	Dependence on substance
		303	Alcohol dependence		combin.
		304	Drug (unspecified) abuse		
13	34	301B	Affective (manic) personality disorder	301.70	Antisocial personality disorder
				303.93	Alcohol dependence
				305.03	Alcohol abuse
				305.70	Amphetamine abuse
				304.40	Amphetamine dependence
14	19	301W	Narcissistic personality disorder	301.70	Antisocial personality disorder
				300.02	Generalized anxiety disorder
				300.29	Simple phobia
				303.93	Alcohol dependence
				305.03	Alcohol abuse
				302.70	Atypical psychosexual dysfunction
15	43	301X	Unspecified personality disorder	296.33	Major recurrent depression
				301.70	Antisocial personality disorder
		311	Unspecified depression	303.93	Alcohol dependence
				305.03	Alcohol abuse
16	50	295H	Schizoaffective psychosis		Withdrew consent to interview
17	24	301H	Antisocial personality disorder		Withdrew consent to interview
		301D	Explosive personality disorder		
		303	Alcohol dependence		
18	42	301W	Immature personality disorder	301.70	Antisocial personality disorder
				303.93	Alcohol dependence
19	31	301W	Immature personality disorder	296.23	Major depression—single episode
		311	Unspecified depression		
20	41	301W	Immature personality disorder	301.70	Antisocial personality disorder
				305.03	Alcohol abuse
		303	Alcohol dependence	303.93	Alcohol dependence
				300.29	Simple phobia
				296.23	Major depression—single episode
				300.21	Agoraphobia with panic attacks

disordered offenders.[26] All six deaths in another follow-up study of discharged offenders were suicides, possibly due to affective disorders that went unnoticed.[27] Antisocial behavior was found in 23 of 53 adolescent suicides in a Finnish psychological autopsy study.[28] Although affective disorders are not linked with serious crime, primary depressives are known to commit suicide or kill family members.[29, 30] Recent substance abuse is another risk factor for suicide in prison inmates, particularly in those with concurrent mental disorders or past suicide attempts.[31]

Malingering is an important source of response bias in forensic psychiatric patients.[32] For two reasons, malingering is not a likely explanation of the higher rates of morbidity in our study. First, the probands were informed that the C-DIS findings would not have any legal or treatment implications, and that this was purely a research project. Second, it is generally considered less "smart" to fake mental symptoms, because one's future incarceration in a mental institution may be much longer than a prison term. The overall impression of the interviewer in this study was that the subjects made efforts to answer truthfully.

Did the C-DIS produce spurious, artifactual, and irrelevant diagnoses that do not stand up to clinical scrutiny? That may be the case. Although the reliability of diagnosing personality disorders is low in general, future interviews should include Axis I and Axis II disorders. Prospective, comparative studies are required to establish whether self-reported, computer-assisted diagnoses are valid and re-liable. Since structured diagnostic interviews have been shown to be valid when compared with less systematic routine procedures, and since computer assistance seems at least comparable to paper, these may be reasons to try it. To the surprise of many professionals, patients approve of the computer. In fact, questions on substance abuse and sexual dysfunction tend to yield more honest replies than face-to-face interviews.[33–36] Even patients calling to report daily alcohol consumption using a touch-tone telephone may have advantages over traditional questionnaires.[37]

Controlled longitudinal and independent studies are needed to assess the usefulness of structured psychiatric diagnoses and whether there are beneficial off-set effects of treatment. We recommend such studies, since the consequences of misclassification are crucial to these individuals and to the costs of incarceration, community violence, and substance abuse.

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