

## ORIGINAL PAPER

Michael Soyka · Margot Albus · Birgit Immler · Norbert Kathmann · Hanns Hippus

# Psychopathology in dual diagnosis and non-addicted schizophrenics – are there differences?

Received: 8 January 2001 / Accepted: 6 September 2001

**Abstract** In a previous publication we reported lifetime and 3-month prevalence estimates for substance use in two large samples of schizophrenic inpatients (Soyka et al. 1993). A subsequent analysis of psychopathological findings assessed by means of the AMDP Manual (Guy and Ban 1982) in schizophrenic inpatients of the Haar Mental State Hospital (N=447), in whom a lifetime prevalence for substance use of 42.9 % (3-month prevalence 29 %) had been reported, was performed. While the overall differences between substance using (dual diagnosis) and nonusing schizophrenics were small, dual diagnosis patients in general reported more positive symptoms, especially more intense hallucinations. These differences could basically be demonstrated in patients with current (3-month) substance use on admission but not on discharge possibly as a result of substance use. *Most marked and highly significant results were found with respect to previous suicide attempts and delinquency which were more prevalent in dual diagnosis schizophrenics.* Results of this study indicate that dual diagnosis patients compared to other schizophrenics represent a more disturbed patient group. Implications for the self-medication hypothesis for substance use in schizophrenia and future research in this area are discussed.

**Key words** Schizophrenia · Substance use · Alcoholism · Psychopathology · Delinquency

## Introduction

There is substantial evidence now for substance use, especially alcoholism, being a significant problem in schizophrenia with prevalence estimates of 30 % up to 50 % in clinical samples (Lehman et al. 1994, Mueser et al. 1990, 1992 a, b 2000, Smith and Hucker 1994). Cuffel in 1992 already pointed out that more recent studies have shown higher prevalence estimates for substance abuse in schizophrenics compared to older ones. The term dual diagnosis patients has been introduced to describe this type of patient. High prevalence estimates for alcoholism in schizophrenia have been reported in very different samples and regions as the UK and USA (for review see Mueser et al. 1992 a, Smith and Hucker 1994, Soyka 2000 a), Germany (Soyka et al. 1993) and Australia (Fowler et al. 1998), among others. Prevalence estimates for alcoholism clearly exceed those for other drugs of abuse but are comparatively high for cannabis and cocaine (Mueser et al. 2000).

Obviously due to Berkson's fallacy clinical studies which focus on the evaluation of certain samples, predominantly psychiatric inpatients, may overestimate prevalence estimates of substance abuse. Clear evidence for a significant comorbidity of alcoholism and schizophrenia comes from the Epidemiological Catchment Area Study in which a fourfold increased risk for alcoholism in schizophrenia was reported (Helzer & Pryzbeck 1988, Regier et al. 1990). Other epidemiological studies have also confirmed a high prevalence rate for substance use in schizophrenia (Lindquist & Allebeck 1989).

Reasons for use and the clinical correlates of substance use have not been studied in great detail. Clinical studies indicate that dual diagnosis schizophrenics differ from other schizophrenics in numerous ways. They were found to have a poor prognosis, notorious non-compliance, a young age of onset, male sex and severe social impairment, among others (for review see Soyka 2000 a). Still few studies have addressed psychopathol-

Prof. Dr. M. Soyka (✉) · N. Kathmann · H. Hippus  
Psychiatric Hospital  
University of Munich  
Nußbaumstr. 7  
80336 Munich, Germany

M. Albus · B. Immler  
Haar Mental State Hospital  
Vockestr. 72  
85540 Haar, Germany

ogy in dual diagnosis schizophrenics. Cleghorn et al. (1991) reported more severe hallucinations and delusions in dual diagnosis schizophrenics while others found less severe symptoms (Dixon et al. 1991) or failed to demonstrate significant clinical differences between dual diagnosis patients and other schizophrenics (Seibyl et al. 1993, Mueser et al. 1998).

Studies on the psychopathology of dual diagnosis schizophrenics are of relevance for prevention (*identification of high risk groups*), risk management and therapy of schizophrenics with substance use. We report data on the psychopathology of dual diagnosis schizophrenics compared to other schizophrenics.

## Method

We previously reported clinical data of a study on prevalence estimates for substance use in two samples of schizophrenic patients *consecutively* admitted either to the psychiatric hospital of the University of Munich (N=190) or the Haar Mental State Hospital (N=447) between 8 Jan 1989 and 2 Jan 1990. The latter sample has also been subject of research for a detailed assessment of psychopathology. Details on sample and data acquisition have been *in part* described in a previous publication in this journal (Soyka et al. 1993). Psychiatric diagnoses were made according to ICD-9 criteria (WHO 1978). All patients who met the diagnosis of schizophrenia in this period were clinically examined by an experienced psychiatrist. Diagnostic procedure included physical examination and the Munich Alcoholism Screening Test (Feuerlein et al. 1977, 1980), a frequently used 24-item scale for diagnosis of alcohol dependence with good sensitivity and excellent specificity. Mean scores of > 11 indicate alcohol dependence.

Relevant sociodemographic characteristics of this sample have been given in the previous publication (Soyka et al. 1993). Of the Haar Mental State Hospital patients 237 (53%) were male, 210 (47%) female with a mean age of 38.9 (SD 12.6) years. Of the patients, 74 (16.6%) were first episode psychoses. Mean number of previous admissions to psychiatric hospitals was 5.9 (1–40). Patients had a mean duration of the disorder since onset of psychosis of 11.2 years (SD 9.9 years). Lifetime estimates for substance use were found to be 42.9% for the Haar Mental State Hospital patients (alcohol abuse and dependence only 34.6%); the 3 month prevalence estimate was 29% (alcohol only 20.8%). Drugs preferably abused were cannabis (15.4%), cocaine (6.7%), psychostimulants (5.3%), benzodiazepines or other hypnotics (9.6%), hallucinogens (9.1%) and opioids (4.9%). Mean age at onset of substance use was 29.7 (SD 10.7) years.

Psychopathology of patients of the Haar Mental State Hospital was assessed by experienced clinicians independent from treatment of patients on admission and discharge by means of the AMDP protocol (English version: Guy and Ban 1982), a detailed manual for assessment and documentation of more than 100 well-defined psychopathological symptoms which were assessed in a semi-structured interview regarding presence or absence of each symptom on admission and discharge. Symptoms in the AMDP protocol are organized under 13 major categories and provide a comprehensive review of psychopathological manifestations. They can be scaled as either absent (0), mild (1), moderate (2) or severe (3). The AMDP protocol has been developed and continuously reexamined by an expert group of psychiatrists and is frequently used at least in German speaking countries for psychopathological or clinical studies. The AMDP system had also been established at the Psychiatric Hospital of the University of Munich in the early 1980s. All researchers involved in this study were familiar with this research instrument.

### ■ Data processing

For each psychopathological symptom assessed on the basis of the scaling described above, a mean value reflecting the intensity of the

symptom is given (0= absent, 3= maximum severity). Mean values are given for admission and discharge. Two different evaluations were made: in the first analysis, patients with a lifetime diagnosis of substance use were compared with the other nonabusing schizophrenics. This sample includes patients with current (= 3 month prevalence) substance use. In the second analysis patients with current (3 month prevalence) substance use only were compared to the other patients. Data analysis was made by means of the program package SPSS (SPSS Inc, Chicago and Gorinchem, SPSS PC V 2.0 Base Manual). Mean values for each symptom were compared between groups by means of t-tests. Frequency data were analyzed by chi-square tests. The level of clear significance was set at  $p < 0.001$  because of the large number of tests.

## Results

As previously reported (Soyka et al. 1993) lifetime prevalence for substance use disorders was 42.9% (N=192) for the whole sample. Three month prevalence estimates were 29% (N=130). Psychopathological symptoms most frequently recorded (highest mean value) were incoherence (for formal thought disorders), delusions of persecution (for delusions) and verbal hallucinations (for disorders of perception, see Table 1), reflecting the typical symptomatology of acute schizophrenic psychosis.

With respect to lifetime diagnosis the overall differences between both groups were small and a few symptoms were found to be significantly more frequent or severe in the dual diagnosis group on admission: thought insertion ( $< 0.05$ ), logorrhea ( $< 0.05$ ), mutism ( $< 0.05$ ) and affective rigidity ( $< 0.05$ ). Other symptoms showed a tendency to be more frequent in the dual diagnosis group: delusional mood (0.09), irritability (0.08), and increased drive (0.09). Symptoms less frequent in the dual diagnosis group were parathymia and mutism ( $< 0.05$ ), and inhibition of drive (0.09). At discharge very few symptoms were found to differ between groups: thought insertion ( $< 0.05$ ) and thought withdrawal (0.07) were more severe in the dual diagnosis group, lack of drive (0.08) and mutism (0.09) in the nonabusing group.

With respect to the second analysis (current substance use only), the overall differences between groups were more pronounced on admission (see Table 2). Symptoms more frequent in the dual diagnosis group were irritability ( $< 0.05$ ), increased drive (0.01), logorrhea (0.05) and tremor ( $< 0.05$ ), disturbances of concentration (0.08), sudden delusional ideas ( $< 0.05$ ), delusions of guilt ( $< 0.05$ ), reference (0.09) and of jealousy (0.07), verbal hallucinations (0.09) and other auditory hallucinations (0.06), visual hallucinations ( $< 0.05$ ), thought withdrawal and thought insertion (both  $< 0.05$ ) and dysphoria (0.06). Symptoms more intense in the nonabusing group were delusions of guilt (0.05), retarded thinking (0.09), restricted thinking (0.07), derealization (0.07), anxiety (0.05), inhibition of drive (0.01), mannerisms and mutism (both  $< 0.05$ ). Again few differences could be demonstrated between groups at discharge. Patients in the dual diagnosis group were found to suffer from more intense visual hallucinations ( $< 0.05$ ), thought withdrawal, thought insertion, other feel-

**Table 1** Psychopathological symptoms in schizophrenic patients with (n=192) and without (n=255) a life-time diagnosis of substance-use-disorder: comparison of the mean values of items in the AMDP-Manual

Diagnosis (ICD)	Schizophrenia without addiction		Schizophrenia with addiction		Significance	
AMDP Item no.	A	D	A	D	A	D
Formal disorders of thought						
15. Inhibited thinking	0.086	0.027	0.067	0.015	Ns	Ns
16. Retarded thinking	0.403	0.125	0.296	0.088	Ns	Ns
17. Circumstantial thinking	0.164	0.051	0.182	0.052	Ns	Ns
18. Restricted thinking	0.384	0.102	0.281	0.104	Ns	Ns
19. Perseveration	0.121	0.039	0.088	0.040	Ns	Ns
20. Rumination	0.023	0.003	0.063	0.026	Ns	Ns
21. Pressured thinking	0.074	0.027	0.057	0.036	Ns	Ns
22. Flight of ideas	0.235	0.062	0.265	0.057	Ns	Ns
23. Tangential thinking	0.474	0.098	0.515	0.104	Ns	Ns
24. Blocking	0.227	0.051	0.151	0.052	Ns	Ns
25. Incoherence	0.658	0.184	0.666	0.239	Ns	Ns
26. Neologisms	0.078	0.039	0.104	0.052	Ns	Ns
Phobias and compulsions						
27. Suspiciousness	0.172	0.090	0.161	0.119	Ns	Ns
28. Hypochondriasis	0	0	0.031	0.010	–	–
29. Phobias	0.011	0.003	0.010	0.005	Ns	Ns
30. Obsessive thoughts	0.031	0.011	0.020	0.010	Ns	Ns
31. Compulsive impulses	0.007	0.007	0.010	0.005	Ns	Ns
32. Compulsive actions	0.035	0	0	0	–	–
Delusions						
33. Delusional mood	0.184	0.054	0.312	0.109	(0.09)	Ns
34. Delusional perceptions	0.200	0.082	0.203	0.104	Ns	Ns
35. Sudden delusional idea	0.066	0.023	0.145	0.057	Ns	Ns
36. Delusional ideas	0.482	0.102	0.526	0.151	Ns	Ns
37. Systematized delusions	0.141	0.078	0.130	0.057	Ns	Ns
38. Delusional dynamics	0.184	0.054	0.234	0.064	Ns	Ns
39. Delusions of reference	0.556	0.176	0.640	0.255	Ns	Ns
40. Delusions of persecution	1.352	1.208	0.443	0.385	Ns	Ns
41. Delusions of jealousy	0.007	0.007	0.046	0.010	Ns	Ns
42. Delusions of guilt	0.105	0.035	0.104	0.031	Ns	Ns
43. Delusions of impoverishment	0.015	0.003	0	0	–	–
44. Hypochondriac delusions	0.058	0.031	0.026	0.015	Ns	Ns
45. Delusions of grandeur	0.384	0.149	0.468	0.161	Ns	Ns
46. Other delusions	0.235	0.102	0.260	0.125	Ns	Ns
Disorders of perception						
47. Illusions	0.010	0	0	0	–	–
48. Verbal (phonemic) hallucinations	0.968	0.235	0.979	0.296	Ns	Ns
49. Other auditory hallucinations	0.356	0.137	0.343	0.151	Ns	Ns
50. Visual hallucinations	0.211	0.054	0.317	0.099	Ns	Ns
51. Bodily hallucinations (coenesthetic)	0.223	0.066	0.213	0.062	Ns	Ns
52. Olfactory or gustatory hallucinations	0.015	0	0.010	0	Ns	–
Disorders of ego						
53. Derealization	0.203	0.019	0.151	0.041	Ns	Ns
54. Depersonalization	0.203	0.043	0.244	0.083	Ns	Ns
55. Thought broadcasting	0.121	0.027	0.182	0.057	Ns	Ns
56. Thought withdrawal	0.137	0.035	0.197	0.093	Ns	(0.07)
57. Thought insertion	0.145	0.047	0.359	0.132	< 0.05	< 0.05
58. Other feelings of alien influence	0.388	0.121	0.401	0.166	Ns	Ns
Disturbances of affect						
59. Perplexity	0.552	0.180	0.567	0.218	Ns	Ns
60. Feeling of loss of feeling	0.035	0.015	0.015	0.005	Ns	Ns

Mean values for symptoms given; A Admission; D Discharge; Items 1–4 (Disorders of consciousness), 5–8 (Disturbances of orientation) and 9–14 (Disturbances of attention) were seldom used and are not given in detail.

**Table 1** Continued

Diagnosis (ICD)	Schizophrenia without addiction		Schizophrenia with addiction		Significance	
AMDP Item no.	A	D	A	D	A	D
61. Blunted affect	0.152	0.090	0.239	0.099	Ns	Ns
62. Felt loss of vitality	0.043	0.015	0.046	0.026	Ns	Ns
63. Depressed mood	0.686	0.207	0.718	0.224	Ns	Ns
64. Hopelessness	0.141	0.031	0.192	0.062	Ns	Ns
65. Anxiety	0.647	0.196	0.562	0.151	Ns	Ns
66. Euphoria	0.251	0.062	0.328	0.067	Ns	Ns
67. Dysphoria	0.502	0.172	0.619	0.177	Ns	Ns
68. Irritability	0.580	0.192	0.760	0.239	(0.08)	Ns
69. Inner restlessness	0.525	0.172	0.536	0.130	Ns	Ns
70. Complaintiveness	0.109	0.039	0.125	0.052	Ns	Ns
71. Feelings of inadequacy	0.066	0.023	0.104	0.041	Ns	Ns
72. Exaggerated self-esteem	0.129	0.070	0.078	0.026	Ns	Ns
73. Feelings of guilt	0.058	0.011	0.078	0.010	Ns	Ns
74. Feelings of impoverishment	0	0	0	0	–	–
75. Ambivalence	0.113	0.062	0.130	0.046	Ns	Ns
76. Parathymia	0.337	0.137	0.177	0.104	P < 0.05	Ns
77. Affective lability	0.294	0.109	0.302	0.130	Ns	Ns
78. Affective incontinence	0.047	0.015	0.015	0	Ns	–
79. Affective rigidity	0.407	0.219	0.588	0.307	P < 0.05	Ns
Disorders of drive and psychomotility						
80. Lack of drive	0.313	0.184	0.265	0.109	Ns	(0.08)
81. Inhibition of drive	0.380	0.149	0.239	0.109	(0.06)	Ns
82. Increased drive	0.560	0.149	0.739	0.177	(0.09)	Ns
83. Motor restlessness	0.654	0.172	0.708	0.166	Ns	Ns
84. Parakinesia	0	0	0	0	–	–
85. Mannerisms	0.180	0.054	0.119	0.041	Ns	Ns
86. Histrionics	0.111	0.007	0.005	0	Ns	Ns
87. Mutism	0.117	0.023	0.036	0.005	< 0.05	(0.09)
88. Logorhea	0.231	0.062	0.406	0.109	< 0.05	Ns
Circadian disturbances						
89. Worse in the morning	0.019	0.007	0.020	0	Ns	–
90. Worse in the evening	0.027	0.015	0.010	0.010	Ns	Ns
91. Better in the evening	0.011	0.003	0.020	0	Ns	Ns
Other disturbances						
92. Social withdrawal	0.411	0.251	0.395	0.234	Ns	Ns
93. Excessive social contact	0.149	0.066	0.213	0.104	Ns	Ns
94. Aggressiveness	0.576	0.141	0.614	0.171	Ns	Ns
95. Suicidal tendencies	0.392	0.109	0.433	0.067	Ns	Ns
96. Self-mutilation	0.058	0.027	0.036	0.015	Ns	Ns
97. Lack of feeling ill	0.619	0.243	0.614	0.250	Ns	Ns
98. Lack of insight	1.058	1.099	0.443	0.510	Ns	Ns
99. Uncooperativeness	0.121	0.039	0.156	0.067	Ns	Ns
100. Lack of self-care	0.023	0.023	0	0	Ns	Ns
101. Difficulty falling asleep	0.090	0.019	0.145	0.026	Ns	Ns
102. Interrupted sleep (middle insomnia)	0.090	0.019	0.145	0.020	Ns	Ns
103. Rigor	0.027	0.015	0.026	0.005	Ns	Ns
104. Tremor	0.015	0.011	0.057	0.031	Ns	Ns
105. Dyskinesia	0.027	0.027	0.026	0.015	Ns	Ns
106. Hypokinesia	0.011	0.011	0.015	0.005	Ns	Ns

Mean values for symptoms given; A Admission; D Discharge; Items 1–4 (Disorders of consciousness), 5–8 (Disturbances of orientation) and 9–14 (Disturbances of attention) were seldom used and are not given in detail.

**Table 2** Psychopathological symptoms in schizophrenic patients with current (3-month prevalence,  $n=130$ ) substance use compared to other schizophrenics

Diagnosis (ICD)	Schizophrenia without addiction		Schizophrenia addiction		Significance	
	A	D	A	D	A	D
AMDP Item no.						
Formal disorders of thought						
15. Inhibited thinking	0.091	0.028	0.462	0.007	Ns	Ns
16. Retarded thinking	0.394	0.104	0.269	0.123	(0.09)	Ns
17. Circumstantial thinking	0.173	0.044	0.169	0.069	Ns	Ns
18. Restricted thinking	0.381	0.104	0.238	0.100	(0.07)	Ns
19. Perseveration	0.104	0.034	0.115	0.061	Ns	Ns
20. Rumination	0.050	0.012	0.154	0.015	Ns	Ns
21. Pressured thinking	0.066	0.028	0.069	0.038	Ns	Ns
22. Flight of ideas	0.233	0.056	0.284	0.069	Ns	Ns
23. Tangential thinking	0.479	0.088	0.523	0.130	Ns	Ns
24. Blocking	0.201	0.044	0.176	0.069	Ns	Ns
25. Incoherence	0.618	0.170	0.769	0.300	Ns	< 0.05
26. Neologisms	0.006	0.003	0.015	0.007	Ns	Ns
Phobias and compulsions						
27. Suspiciousness	0.148	0.078	0.215	0.161	Ns	(0.07)
28. Hypochondriasis	0.003	0.003	0.038	0.007	Ns	Ns
29. Phobias	0.009	0.003	0.015	0.007	Ns	Ns
30. Obsessive thoughts	0.025	0.009	0.030	0.015	Ns	Ns
31. Compulsive impulses	0.006	0.006	0.015	0.015	Ns	Ns
32. Compulsive actions	0.028	0	0	0	–	–
Delusions						
33. Delusional mood	0.208	0.056	0.315	0.130	Ns	Ns
34. Delusional perceptions	0.195	0.075	0.215	0.130	Ns	Ns
35. Sudden delusional idea	0.063	0.025	0.192	0.069	< 0.05	Ns
36. Delusional ideas	0.501	0.119	0.500	0.130	Ns	Ns
37. Systematized delusions	0.148	0.075	0.107	0.053	Ns	Ns
38. Delusional dynamics	0.186	0.050	0.253	0.084	Ns	Ns
39. Delusions of reference	0.536	0.176	0.730	0.292	(0.09)	(0.07)
40. Delusions of persecution	1.290	0.406	1.292	0.446	Ns	Ns
41. Delusions of jealousy	0.006	0.006	0.069	0.015	(0.07)	Ns
42. Delusions of guilt	0.129	0.044	0.046	0.007	(0.05)	< 0.05
43. Delusions of impoverishment	0.012	0	0.003	0	–	Ns
44. Hypochondriac delusions	0.047	0.025	0.038	0.023	Ns	Ns
45. Delusions of grandeur	0.372	0.145	0.538	0.176	Ns	Ns
46. Other delusions	0.242	0.097	0.253	0.146	Ns	Ns
Disorders of perception						
47. Illusions	0.009	0	0	0	–	–
48. Verbal (phonemic) hallucinations	0.908	0.224	1.130	0.353	(0.09)	(0.06)
49. Other auditory hallucinations	0.296	0.116	0.484	0.207	(0.06)	Ns
50. Visual hallucinations	0.186	0.047	0.430	0.138	< 0.05	< 0.05
51. Bodily hallucinations (coenesthetic)	0.236	0.063	0.176	0.069	Ns	Ns
52. Olfactory or gustatory hallucinations	0.012	0	0.015	0	Ns	–
Disorders of ego						
53. Derealization	0.211	0.031	0.107	0.023	(0.07)	Ns
54. Depersonalization	0.198	0.044	0.276	0.100	Ns	Ns
55. Thought broadcasting	0.119	0.025	0.215	0.076	Ns	Ns
56. Thought withdrawal	0.116	0.028	0.276	0.138	< 0.05	< 0.05
57. Thought insertion	0.179	0.047	0.376	0.169	< 0.05	< 0.05
58. Other feelings of alien influence	0.353	0.104	0.492	0.230	Ns	< 0.05
Disturbances of affect						
59. Perplexity	0.577	0.189	0.515	0.215	Ns	Ns
60. Feeling of loss of feeling	0.037	0.015	0	0	–	–

  

Diagnosis (ICD)	Schizophrenia without addiction		Schizophrenia addiction		Significance	
	A	D	A	D	A	D
AMDP Item no.						
61. Blunted affect	0.195	0.100	0.176	0.076	Ns	Ns
62. Felt loss of vitality	0.037	0.015	0.061	0.030	Ns	Ns
63. Depressed mood	0.731	0.208	0.623	0.230	Ns	Ns
64. Hopelessness	0.157	0.041	0.176	0.053	Ns	Ns
65. Anxiety	0.671	0.198	0.461	0.123	< 0.05	Ns
66. Euphoria	0.274	0.069	0.307	0.053	Ns	Ns
67. Dysphoria	0.492	0.157	0.700	0.215	(0.06)	Ns
68. Irritability	0.058	0.176	0.823	0.300	< 0.05	(0.05)
69. Inner restlessness	0.523	0.160	0.546	0.138	Ns	Ns
70. Complaintiveness	0.104	0.031	0.146	0.076	Ns	Ns
71. Feelings of inadequacy	0.078	0.028	0.092	0.038	Ns	Ns
72. Exaggerated self-esteem	0.110	0.056	0.100	0.038	Ns	Ns
73. Feelings of guilt	0.056	0.012	0.092	0.007	Ns	Ns
74. Feelings of impoverishment	0	0	0	0	–	–
75. Ambivalence	0.126	0.066	0.107	0.030	Ns	Ns
76. Parathymia	0.318	0.148	0.146	0.061	< 0.05	< 0.05
77. Affective lability	0.293	0.100	0.307	0.161	Ns	Ns
78. Affective incontinence	0.037	0.012	0.023	0	Ns	–
79. Affective rigidity	0.046	0.242	0.546	0.292	Ns	Ns
Disorders of drive and psychomotility						
80. Lack of drive	0.299	0.164	0.276	0.123	Ns	Ns
81. Inhibition of drive	0.375	0.151	0.184	0.084	=0.01	(0.09)
82. Increased drive	0.558	0.142	0.830	0.207	< 0.05	Ns
83. Motor restlessness	0.637	0.160	0.776	0.192	Ns	Ns
84. Parakinesia	0	0.015	0	0	–	–
85. Mannerisms	0.183	0.053	0.084	0.038	< 0.05	Ns
86. Histrionics	0.009	0.006	0.007	0	Ns	–
87. Mutism	0.107	0.018	0.023	0.007	< 0.05	Ns
88. Logorhea	0.252	0.066	0.438	0.123	(0.05)	Ns
Circadian disturbances						
89. Worse in the morning	0.022	0.006	0.015	0	Ns	–
90. Worse in the evening	0.022	0.012	0.015	0.015	Ns	Ns
91. Better in the evening	0.015	0.003	0.015	0	Ns	–
Other disturbances						
92. Social withdrawal	0.400	0.230	0.415	0.276	Ns	Ns
93. Excessive social contact	0.173	0.072	0.184	0.207	Ns	Ns
94. Aggressiveness	0.552	0.123	0.692	0.230	Ns	< 0.05
95. Suicidal tendencies	0.397	0.097	0.307	0.076	Ns	Ns
96. Self-mutilation	0.047	0.022	0.053	0.023	Ns	Ns
97. Lack of feeling ill	0.593	0.214	0.676	0.323	Ns	Ns
98. Lack of insight	1.015	0.410	1.223	0.623	Ns	< 0.05
99. Uncooperativeness	0.110	0.031	0.200	0.100	Ns	(0.05)
100. Lack of self-care	0.018	0	0.018	0	–	–
101. Difficulty falling asleep	0.116	0.022	0.107	0.023	Ns	Ns
102. Interrupted sleep (middle insomnia)	0.116	0.022	0.107	0.015	Ns	Ns
103. Rigor	0.022	0.012	0.038	0.007	Ns	Ns
104. Tremor	0.012	0.009	0.084	0.046	(0.05)	Ns
105. Dyskinesia	0.022	0.022	0.038	0.023	Ns	Ns
106. Hypokinesia	0.009	0.009	0.023	0.007	Ns	Ns

Mean values for symptoms given; A Admission; D Discharge; Items 1–4 (Disorders of consciousness), 5–8 (Disturbances of orientation) and 9–14 (Disturbances of attention) were seldom used and are not given in detail.



ings of alien influence and irritability (all  $< 0.05$ ), thought incoherence ( $< 0.05$ ), suspiciousness (0.07), delusions of reference (0.07), verbal hallucinations (0.06), while delusions of guilt and parathymia (both  $< 0.05$ ) and inhibition of drive (0.09) were less frequent. Interestingly dual diagnosis patients at discharge were also rated higher on aggressiveness, lack of insight (both  $< 0.05$ ) and uncooperativeness ( $=0.05$ ).

While there were no significant differences with respect to acute suicidality as recorded by the AMDP system, patients with a lifetime prevalence of substance use had significantly more often a history of suicide attempts (96 of 192 = 50% in patients with substance use, 95 of the 255 = 37.3% patients without substance use,  $p < 0.01$ ). Only two items reached the level of clear significance as defined in this study: the average number of previous suicide attempts differed in both groups (1.34 for patients with substance use vs. 0.76 for non-substance using patients,  $p < 0.001$ , see Soyka et al. 1993). In addition, patients with substance use had more often a history of delinquency (77 of 197 = 40.1% vs. 35 of 255 = 13.7%,  $p < 0.001$ ).

## Discussion

Comparatively few studies have addressed psychopathology of dual diagnosis compared to other schizophrenics. Reasons for substance use in schizophrenics as discussed below may not differ from those in other patients but its clinical correlates are of special relevance for management of these patients.

In the present study which is a consecutive analysis of data obtained for assessment of prevalence of substance use in schizophrenia (Soyka et al. 1993), psychopathological symptoms in patients with current or lifetime substance use were compared to other schizophrenics. A methodological problem of this study is that a broad number of items as provided by the AMDP protocol were analyzed. Due to multiple testing, the number of relevant differences between groups may be overestimated by this study. Only two items (number of previous suicide attempts and delinquency) reached a level of clear significance defined at the  $< 0.001$  level in this study. Another possible methodological problem should briefly be addressed: effects of medication which may be of relevance especially for symptom patterns at discharge have not been assessed systematically. Still a number of interesting results and findings could be demonstrated in this study.

The major findings and conclusions were the following:

First, the overall differences between substance using and nonusing schizophrenics were not very severe but some interesting symptom patterns could be shown. Marked differences between substance using and nonusing schizophrenics were a higher rate of psychotic ego disturbances (derealization, depersonalization), ambivalence, hopelessness and sudden delusional ideas

and especially a higher rate of previous suicide attempts. These differences could especially be shown comparing patients with current substance use to other schizophrenics. Taken together these findings suggest a more pronounced psychotic or 'positive' symptomatology in dual diagnosis patients compared to others. Whether these results are reasons for use or may reflect consequences of substance use cannot be answered on the basis of this study and must be addressed in future prospective studies. Yet psychopathological differences were more pronounced in the patient group with current substance use only which may indicate that the psychopathological differences are rather a result of substances use in schizophrenia than to be a persisting or predisposing symptom pattern. Since both alcohol and especially the drugs preferably used by schizophrenics (cocaine, psychostimulants, hallucinogens but not opioids) can induce psychotic symptoms, especially the more intense hallucinations in patients with current substance use may be considered as a result of alcohol or drug's action in the brain.

Findings of this study are basically in line with previous studies on that subject (Cleghorn et al. 1991, Scheller-Gilkey et al. 1999). Key features of dual diagnosis patients reported so far are a very high rehospitalization rate, notorious noncompliance and a poor prognosis (Cuffel et al. 1994, DeQuardo et al. 1994, Linszen et al. 1994), male sex, young age at onset, high incidence of homelessness, more positive and less negative symptoms compared to other schizophrenics, more affective disturbance, an increased suicide rate, higher rates of discharge against advice and of violence as discussed below (Soyka 2000a,b). A surprising finding, a somewhat better premorbid function and less severe negative symptoms compared to other schizophrenics, has been reported in some studies (Arndt et al. 1992; Dixon et al. 1991, Scheller-Gilkey et al. 1999) but may be due to selection bias in these samples.

Second, the most significant findings in this study were found with respect to a higher rate of previous delinquency and suicide attempts in dual diagnosis schizophrenics. This is consistent with previous findings in dual diagnosis schizophrenics which suggest an increased risk for violent and disturbed behavior which has been confirmed not only by clinical and community-based studies (Scott et al. 1998, Swartz et al. 1998) but also epidemiological and case register studies (Lindquist and Allebeck 1989; Wallace et al. 1998, for review see Soyka 2000). In addition in our study, patients with current substance use scored significantly higher on items such as aggressiveness, lack of insight and uncooperativeness at discharge, possibly indicating a less favorable outcome. Steadman et al. (1998) examined 1136 patients with major mental disorders, mostly schizophrenia discharged from acute psychiatric inpatient facilities and reported substance use to be a major risk factor for violence in these patients. Data from longitudinal prospective studies of unselected birth cohorts (Hodgins 1992, 1996, Räsänen et al. 1998) have also

shown that substance use in schizophrenia increases the risk for violence and aggression significantly. Medication noncompliance, a poor neuroleptic response, male sex, psychotic symptomatology such as delusions of persecution and frequent intoxications and social variables or a primary antisocial personality may account for that finding, among others. Findings of this study further suggest a higher rate of suicide attempts in dual diagnosis patients. Krausz et al. (1996) concluded schizophrenics with substance use to represent a severely disturbed group of schizophrenics with more depressive symptomatology and suicidal tendencies compared to other schizophrenics.

Third, reasons for use are a matter for debate. As for other psychiatric disorders the self-medication hypothesis has been advocated repeatedly to explain substance use in schizophrenics (Khantzian 1997). Substance use has been associated with the patients' wish to improve psychopathological symptoms such as anhedonia (Pris-tach and Smith 1996) or side effects of neuroleptic treatment. A number of findings question that hypothesis (Brunette et al. 1997). Mueser et al. (1998) stressed the role of antisocial personality disorder in the development of alcoholism but otherwise favored a supersensitivity model which posits that biological vulnerability of psychiatric disorders results in sensitivity to small amounts of alcohol and drugs leading to substance use disorders. While there is no consistent chronological pattern, most studies agree that substance use is far more often secondary to the onset of psychosis than vice versa (Soyka 2000a). The chronological relationship between alcoholism and schizophrenia has been carefully studied by Hambrecht and Häfner (1996) in a longitudinal study. Results of this study suggest that alcohol abuse typically preceded the first signs of schizophrenia, but followed the appearance of the first positive symptom. The prevalence rates for substance use already in first-episode psychosis appear to be significant, ranging between 20 to 30 % (Strakowski et al. 1993).

Substance use in schizophrenia to date seems multifactorial and may not only be discussed on the basis of distinct psychopathological symptoms. Social factors, socioeconomic status, the deinstitutionalization of patients in past decades and the quality of social services may also be of relevance (Mullen et al. 2000).

### Prospects for future research

Although the number of clinical and epidemiological studies giving evidence for a significantly increased risk for alcoholism in schizophrenia is very broad now, more longitudinal studies are necessary to elucidate the inter-relationship between substance use, psychopathology, noncompliance, treatment response and outcome in schizophrenia. They may also offer options for prevention by identifying risk groups for later alcoholism. Finally, therapeutic intervention in dual diagnosis schizophrenics remains a challenge. Few studies have

addressed psychosocial approaches (Drake and Mueser 2000, Johnson 1997, Hellerstein et al. 1995) or psychopharmacological options in dual diagnosis schizophrenics (Soyka 1996, Wilkins 1997). The use of novel atypical neuroleptics (Buckley 1997) such as clozapine (Drake et al. 2000, Zimmet et al. 2000) or depot neuroleptics such as flupenthixol (Levin et al. 1998) and antidepressants (Siris 1990, Siris et al. 1991, 1993) have been advocated. A more systematic assessment of the efficacy of different outpatient and inpatient programs for dual diagnosis schizophrenia is needed.

### References

1. Arndt S, Tyrell G, Flaum M, Andreasen NC (1992) Comorbidity of substance abuse and schizophrenia: the role of pre-morbid adjustment. *Psychological Medicine* 22: 379–388
2. Brunette MF, Mueser KT, Xie H, Drake H (1997) Relationships between symptoms of schizophrenia and substance abuse. *Journal of Nervous and Mental Disorders* 185: 13–20
3. Cantwell R, Brewin J, Glazebrook C, Dalkin T, Fox R, Medley I, Harrison G (1999) Prevalence of substance use in first-episode psychosis. *British Journal of Psychiatry* 174: 150–153
4. Cleghorn JM, Kaplan RD, Szechtman B, Szechtman H, Brown GM, Franco S (1991) Substance abuse and schizophrenia: effect on symptoms but not on neurocognitive function. *Journal of Clinical Psychiatry* 52: 26–30
5. Cuffel BJ (1992) Prevalence estimates of substance abuse in schizophrenia and their correlates. *Journal of Nervous and Mental Disease*, 180: 589–592
6. Cuffel BJ, Shumway M, Chouljian TL et al. (1994) A longitudinal study of substance use and community violence in schizophrenia. *Journal of Nervous and Mental Disease* 182: 704–708
7. DeQuardo JR, Carpenter CF, Tandon R (1994) Patterns of substance abuse in schizophrenia: nature and significance. *Journal of Psychiatric Research* 28: 267–275
8. Dixon I, Haas G, Weiden PJ, et al. (1991) Drug abuse in schizophrenic patients: clinical correlates and reasons for use. *American Journal of Psychiatry* 148: 224–230
9. Drake RE, Mueser KT (2000) Psychosocial approaches to dual diagnosis. *Schizophrenia Bulletin* 26: 105–118
10. Feuerlein W, Ringer C, Küfner H, Antons K (1980) Diagnose des Alkoholismus. Der Münchner Alkoholismustest (MALT). *Münchner Medizinische Wochenschrift* 119: 1275–1282
11. Feuerlein W, Ringer C, Küfner H, Antons K (1980) Diagnosis of alcoholism: the Munich Alcoholism Test (MALT). In: Galanter M (ed) *Currents in Alcoholism*, Vol VII. New York, Grune & Stratton
12. Fowler JL, Carr VC, Carter NT, et al. (1998) Patterns of current and lifetime substance use in schizophrenia. *Schizophrenia Bulletin* 24: 443–455
13. Guy W, Ban TA (1982) The AMDP-System. Manual for the Assessment and Documentation of Psychopathology. Berlin Heidelberg New York: Springer
14. Hambrecht M, Häfner H (1996) Substance abuse and the onset of schizophrenia. *Biological Psychiatry* 40: 1155–1163
15. Hellerstein DJ, Rosenthal RN, Miner CR (1995) A prospective study of integrated outpatient treatment for substance-abusing schizophrenic patients. *American Journal of Addiction* 4: 33–42
16. Helzer JD, Pryzbeck TR (1988) The co-occurrence of alcoholism with other psychiatric disorders in the general population and its impact on treatment. *Journal Studies on Alcoholism* 49: 219–224
17. Hodgins S (1992) Mental disorder, intellectual deficiency, and crime: evidence from a birth cohort. *Archives of General Psychiatry* 49: 476–483
18. Hodgins S, Mednick SA, Brennan PA, Schulsinger F, Engberg M (1996) Mental disorder and crime: evidence from a Danish cohort. *Archives of General Psychiatry* 53: 489–496

19. Johnson S (1997) Dual diagnosis of severe mental illness and substance misuse: a case for specialist services? *British Journal of Psychiatry* 171: 205–208
20. Khantzian EJ (1997) The self-medication hypothesis of substance use disorders: a reconsideration and recent applications. *Harvard Review of Psychiatry* 4: 231–244
21. Lehman AF, Myers CP, Corty E, Thompson JW (1994) Prevalence and patterns of “dual diagnosis” among psychiatric inpatients. *Comprehensive Psychiatry* 35: 1–5
- 21a. Levin FR, Evans SM, Coomaraswamy S, Collins ED, Regent N, Kleber HD (1997) Flupenthixol treatment of cocaine abusers with schizophrenia: a pilot study. *American Journal of Drug and Alcohol Abuse* 24: 343–360
22. Lindquist P, Allebeck P (1989) Schizophrenia and assaultive behavior: the role of alcohol and drug abuse. *Acta Psychiatrica Scandinavica* 82: 191–195
23. Linszen DH, Dingemans PM, Lenior ME (1994) Cannabis abuse and the course of recent-onset schizophrenic disorders. *Archives of General Psychiatry* 51: 273–279
24. Mueser KT, Yarnold PR, Levinson DF, Singh H, Bellack AS, Kee K, Morrison RL, Yadam KG (1990) Prevalence of substance abuse in schizophrenia: demographic and clinical correlates. *Schizophrenia Bulletin* 16: 31–56
25. Mueser KT, Bellack AS, Blanchard JJ (1992 a) Comorbidity of schizophrenia and substance abuse: implications for treatment. *Journal of Consulting and Clinical Psychology* 60: 845–856
26. Mueser KT, Yarnold PR, Bellack AS (1992 b) Diagnostic and demographic correlates of substance abuse: implications for treatment. *Journal of Consulting and Clinical Psychology* 60: 845–856
27. Mueser KT, Drake RE, Wallach MA (1998) Dual diagnosis: a review of etiological theories. *Addictive Behaviors* 23: 717–734
28. Mueser KT, Yarnold PR, Rosenberg SD, Swett C, Miles KM, Hill D (2000) Substance use disorder in hospitalized severely mentally ill psychiatric patients: prevalence, correlates, and subgroups. *Schizophrenia Bulletin* 26: 179–192
29. Mullen PE, Burgess P, Wallace C, Palmer S, Ruschena D (2000) Community care and criminal offending in schizophrenia. *Lancet* 355: 614–617
30. Pristach CA, Smith CM (1996) Self-reported effects of alcohol use on symptoms of schizophrenia. *Psychiatry Services* 47: 421–423
31. Räsänen P, Tiihonen J, Isohanni M, Rantakallio P, Lehtonen J, Moring J (1998) Schizophrenia, alcohol abuse, and violent behavior: a 26-year follow-up study of an unselected birth cohort. *Schizophrenia Bulletin* 24: 437–441
32. Regier DA, Farmer ME, Rae DS, et al. (1990) Comorbidity of mental disorders with alcohol and other drug abuse: results from the epidemiological catchment area (ECA) study. *Journal of the American Medical Association* 264: 2511–2518
33. Scheller-Gilkey G, Lewine RRJ, Caudle J, Brown FW (1999) Schizophrenia, substance use, and brain morphology. *Schizophrenia Research* 35: 113–120
34. Scott H, Johnson S, Menezes P, Thornicroft G, Marshall J, Bindman J, Bebbington P, Kuipers W (1998) Substance misuse and risk of aggression and offending among the severely mentally ill. *British Journal of Psychiatry* 172: 345–350
35. Seibyl JP, Satel SL, Anthony D, Southwick SM, Krystal JH, Charney DS (1993) Effects of cocaine on hospital course in schizophrenia. *Journal of Mental Disease* 181: 31–37
36. Smith J, Hucker S (1994) Schizophrenia and substance abuse. *British Journal of Psychiatry* 165: 13–21
37. Soyka M (1996) Dual diagnosis in patients with schizophrenia. Issues in pharmacological treatment. *CNS Drugs* 6: 414–425
38. Soyka M (2000 a) Alcoholism and schizophrenia. *Addiction* 95: 1613–1618
39. Soyka M (2000 b) Substance abuse, psychiatric disorder and disturbed behavior. *British Journal of Psychiatry* 176: 345–350
40. Soyka M, Albus M, Finelli A, et al. (1993) Prevalence of alcohol and drug abuse in schizophrenic inpatients. *European Archives of Psychiatry and Clinical Neuroscience* 242: 362–372
41. Steadman HJ, Mulvey EP, Monahan J, Robbins PC, Appelbaum PS, Grisso T, Roth LH, Silve E (1998) Violence by people discharged from acute psychiatric inpatient facilities and by others in the same neighborhoods. *Archives of General Psychiatry* 55: 393–401
42. Strakowski SM, Tohen M, Stoll AL, et al. (1993) Comorbidity in psychosis at first hospitalization. *American Journal of Psychiatry* 150: 752–757
43. Swartz MS, Swanson JW, Hiday VA, Borum R, Wagner HR, Burns BJ (1998) Violence and severe mental illness: the effects of substance abuse and nonadherence to medication. *American Journal of Psychiatry* 155: 226–231
44. Wallace C, Mullen P, Burgess P, Palmer S, Ruschena D, Browne C (1998) Serious criminal offending and mental disorder. *British Journal of Psychiatry* 172: 477–484
45. Wilkins JN (1997) Pharmacotherapy of schizophrenia patients with comorbid substance abuse. *Schizophrenia Bulletin* 23: 215–228