



## The impact of alcohol dependence on the course and psychopathology of schizophrenia

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### Summary

**Aim.** The study has been undertaken to investigate a possible influence of alcoholism on the course and psychopathology of schizophrenia.

**Method.** A representative sample of 61 subjects was selected from the schizophrenic patients with a history of alcohol dependence (dual diagnosis), registered in the period of 1997-2000. They were compared with 60 control patients, with a single diagnosis of schizophrenia. In the two groups, the onset, course and psychopathology of schizophrenia were assessed with the use interviews and clinical scales.

**Results.** Male patients with schizophrenia and alcohol dependence were of a later mean age at the onset of the mental illness. In case of women, a higher rate of alcohol abuse in the family was noticed when compared with the control groups. In men with dual diagnosis, the negative symptoms were less prominent. Women with schizophrenia and alcohol dependence reported more depressive symptomatology.

### schizophrenia / alcoholism / comorbidity

### INTRODUCTION

The term “dual diagnosis” has no equivalent in the DSM-IV or ICD-10 classifications. It refers to the clinical situations in which two parallel diagnosis of mental disorders are put forward: one being related to psychoactive substance abuse and the other to a mental illness. The diagnosis in reference to alcohol abuse is reserved for conditions identified in ICD-10 as harmful drinking and alcohol dependence, and not to the periodic forms of alcohol overuse by the mentally ill. The idea is that for such a diagnosis, the harmful drinking pattern is to be maintained for at least a month a year. In order to use the term justifi-

ably we have to be sure that the overuse of the psychoactive substance in question is causing a considerable psychical, somatic and social damage in a patient. The term has become particularly popular in the USA. It originally appeared when the two comorbid conditions were first noticed to be on the increase, and the relevance of both of them was appreciated in planning effective forms of therapy [1, 2].

The comorbidity of schizophrenia and alcohol abuse (cases of dual diagnosis) was first noticed in the 1970's, although some single studies on the subject were published in Poland and abroad before. In 1909, Graeter reported on a frequent coexistence of hebephrenic schizophrenia and alcoholism, and in 1961 Johanson studied the importance of clinical consequences of the concurrence of these conditions [3]. Also in 1955, Bleuler thought that alcoholism was often associated with schizophrenia. He based his views on the observation of the characteristics of individual psychotic symptoms in long-term alcohol-

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ism, and also on the well known fact of "drunkenness" amongst schizophrenics [4]. In 1990, a new research began into the widespread coexistence of mental disorders and alcohol dependence. The research showed that amongst the 13% of the members of general population who overuse alcohol, as many as 3.8% suffer from schizophrenia. Apart from the epidemiological research there were more and more reports on the effect that alcohol abuse has on the course and clinical picture of schizophrenia [5]. In 1994, Duke pointed out to the fact that in this group of sufferers, there is the highest proportion of men, often homeless, and in conflict with their families. He thought that in comparison to people with a single diagnosis of schizophrenia, they were characterized by a higher intensity of productive symptoms, and a lower concentration of negative symptoms. Similar results in respect of positive and negative symptoms were obtained by Talamo et al. In their opinion, a lower concentration of defective symptoms amongst the patients with a dual diagnosis is linked to the better overall functioning of these patients prior to the onset of the mental illness, and also with their tendency to look for new sensations and stimuli [7, 8]. As it turned out, people suffering from schizophrenia are particularly sensitive to the impact of alcohol and hence even a small amount of it can cause additional mental health problems and social behaviour disorders. The analysis of data describing the behaviour of these patients showed that they were characterized by a higher correlate of aggression and autoaggression [9]. Strakowsky et al. (1994) concluded that the symptoms of depression and anxiety were also typical for this group of patients.

Many issues relating to the impact of alcohol dependence on the course and clinical picture of schizophrenia remain unresolved [10, 11, 12, 13, 14, 15, 16, 17, 18]. Drawing any straightforward conclusions about the correlations between schizophrenia and alcohol dependence has been made difficult by the fact that patients differ a lot from one another in many different ways, and also in view of the time of the onset of their alcohol dependency. Taking into account the chronology of both disorders, patients with dual diagnosis can be divided into three groups. In the first group there are those who have overused alcohol prior to the onset of the symptoms of

schizophrenia. The second group, much smaller, consists in the patients whose alcohol dependency occurred approximately at the time of the onset of schizophrenia. In the third group, there are patients who have been diagnosed with schizophrenia prior to the occurrence of the alcohol problem [16].

The difficulties may also arise from the methodological differences between the various types of research, and the limitations in obtaining data from the schizophrenic patients whose additional condition is exclusively alcohol dependency. Patients of Polish psychiatric hospitals may be an exception here, with a lower occurrence of cross-dependencies. In this group of patients, the preliminary analysis of data available revealed considerable clinical differences in relation to the chronology of disorders and the depressive symptoms that are more frequent in case of women. Therefore, the researched group in this study has been divided into men and women.

#### AIM OF THE STUDY

The goal of this research was to refer to the results of the previous research on the impact of alcohol dependency on the course and clinical status of schizophrenia. We aimed to answer the following questions:

- A) Are the patients with a dual diagnosis different from the patients with a single diagnosis, with regards to the age of the onset of schizophrenia and the intensity of psychopathological symptoms i.e. positive, negative and depressive symptoms?
- B) Is alcoholism in the family relevant to the occurrence of alcohol dependency in case of patients with a dual diagnosis?
- C) Do women and men with a dual diagnosis differ in respect of the course and clinical status of schizophrenia?

#### MATERIAL AND METHODS

The research involved 121 patients hospitalised in the Psychiatric Clinic of the Medical Academy in Białystok, and in the Psychiatric Hospital in Choroszczka in 1997–2000. The research excluded the patients with organic mental disorders, mental disabilities, and those dependent on other psy-

choactive substances. Patients, who were familiarised with the aim of the research and who gave their consent orally, were evaluated between the first and second week of their hospitalisation. The group comprised 46 men and 15 women, diagnosed with schizophrenia and alcohol dependence, (the mean age of men was 41.1, SD=1.06 and 41.92 in case of women, SD = 2.15). These patients were compared with the control groups comprising 45 men and 15 women, diagnosed exclusively with schizophrenia (the mean age in the group of men was 40.11, SD = 1.07, and in the group of women 45.2, SD = 2.06). The diagnosis of schizophrenia and alcohol dependency was established using the International Classification of Diseases ICD-10, whereas for the evaluation of the clinical status we devised our own questionnaire that included patient details and the details of the course of their illness. We applied the following psychopathological scales: Positive and Negative Symptoms Scale according to Kay (PANSS) [19], Hamilton Depression Rating Scale [20], and the Premorbid Adjustment Scale according to Cannon Spoor in Grzywa's translation and adaptation. For the evaluation of alcohol dependency, our own questionnaire was used again, which included details of alcohol problems in the patient's family, first contact with alcohol, age of the beginning of alcohol dependency, the presence of withdrawal symptoms, the number of intoxication-related hospitalisations and the Michigan Alcoholism Screening Test MAST [21]. In the group of men with a dual diagnosis, the medication used during the research was mostly from the group of first-generation neuroleptics: 21.7% took Chlorpromazine, 19.5% were medicated with Perazine. In the control group it was Risperidone that was used most frequently (in case of 21.6% of patients), and Clozapine by 18.9%. Amongst the women with a dual diagnosis, most patients were treated with Perazine (54%) and in the control group with Risperidone. None of the patients were given anti-depressants.

### Statistical analysis

In comparing the mean values, the analysis of variance (ANOVA), analysis of covariance (ANCOVA) and the Mann-Whitney *U* test have been used. The proportions and frequencies were com-

pared with the Chi-square test, with Yate's correction for continuity, the *U* test for two frequencies and Fisher's exact test. Qualitative dependencies have been analysed with the use of Pearson's product-moment correlation coefficient and Spearman's rank correlation coefficient. For overall calculations and for the calculations of arithmetic mean and standard deviations (SD), a SAS software for Windows was used.

## RESULTS

### I. The results obtained in the researched and control groups of men.

#### a) Comparison of demographic factors.

The groups did not differ in any significant way as far as the age, education, place of residence, marital status, employment; military service status and the source of hospital referral of the patients were concerned. The occurrence of schizophrenia in the family was similar in both groups. In the studied group, the age of the onset of schizophrenia and the age of the first schizophrenia-related hospitalisation was later than in the control group. No significant differences were noted in the total average number of hospitalisations in both groups (Tab.1).

**Table 1.** Comparison of data regarding the course of the illness in the studied and control group of men. Differences between the groups were statistically relevant at the level  $p < 0.05$ .

Clinical Scale	Studied group		Control group		p
	Average	SD	Average	SD	
PANSS - NEGAT*	24.8	0.21	27.76	0.0	$p = 0.043$
PANSS - POSITIVE	23.0	0.043	20.95	0.18	$p = 0.1269$
PANSS - GENERAL	48.82	0.18	48.91	0.11	$p = 0.5049$
SPP	59.8	0.28	62.6	0.28	$p = 0.6039$
Hamilton's Scale	12.0	0.20	10.5	0.73	$p = 0.4919$

#### b) Comparison of clinical scales.

No statistically relevant differences were observed in the evaluation of the intensification of positive symptoms in PANSS scale between the researched and controlled group of men (Tab. 2).

**Table 2.** Comparison of clinical scales in the studied and control groups of men. The differences between the groups were statistically relevant at the level  $p < 0.05$

Clinical Scale	Studied group		Control group		p
	Average	SD	Average	SD	
PANSS - NEGAT*	24.8	0.21	27.76	0.0	$p = 0.043$
PANSS - POSITIVE	23.0	0.043	20.95	0.18	$p = 0.1269$
PANSS - GENERAL	48.82	0.18	48.91	0.11	$p = 0.5049$
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Hamilton's Scale	12.0	0.20	10.5	0.73	$p = 0.4919$

In the general scale, lower values in the researched group were obtained with regards to a single psychopathological symptom i.e. lack of cooperation ( $p = 0.04$ ), which means that patients with dual diagnosis were more trustful towards a researcher; they also showed less resistance, negativism and hostility. The lack of cooperation was evaluated not only on the basis of patients' behaviour during the interviews, but also on the information gathered from the family and healthcare officials. Moreover, lower values in the PANSS scale were noted in the studied group in the evaluation of the intensification of negative symptoms (Tab. 2). These referred to the following psychopathological symptoms: affective flattening ( $p = 0.004$ ), emotional withdrawal ( $p = 0.003$ ), difficult contact ( $p = 0.03$ ) and stereotype thinking ( $p = 0.04$ ). Based on data analysis in a joined sample, comprising both the studied and control groups of men, it was demonstrated that higher values in the PANSS scale of negative symptoms were obtained by the patients whose premorbid adjustment had been worse ( $p = 0.001$ ). The comparison of results obtained with use of the Hamilton Depression Rating Scale (HDRS) and the Premorbid Adjustment Scale (PAS) did not show any statistically relevant variations between the studied and control group of men.

c) Comparison of the results concerning the evaluation of alcohol dependency syndrome.

In the group of men, the average age of the beginning of alcohol dependency was 26, which correlated negatively with the results of the Michigan Alcoholism Screening Test (MAST)

( $r = -0.28202$ ,  $p = 0.05$ ). The occurrence of alcohol dependency in the patients' family was essentially more frequent in the studied group. In case of the 24 patients (52.17%) with recognized schizophrenia and alcohol dependency, at least one parent was addicted to alcohol ( $p = 0.0007$ ). Statistical relevance was therefore established between the presence of alcohol dependency in the families of patients with a dual diagnosis and the higher values achieved in the MAST test ( $r = 0.42129$ ,  $p = 0.0001$ ). It was also demonstrated that the relation between the age at which the first symptoms of alcohol addiction occurred and the presence of alcohol addiction in the family was equally essential ( $r = -0.35800$ ,  $p = 0.0004$ ). The studied group of men was also evaluated as far as the chronology of the disorders was concerned. Out of the 45 men, ill with schizophrenia and addicted to alcohol, in 28 cases the alcohol dependency preceded the first symptoms of mental illness. In the case of the remaining 17 men, symptoms of schizophrenia had occurred first.

## II. The results obtained in the studied and control group of women:

a) Comparison of demographic factors.

The groups did not essentially differ as far as the age, education, the place of residence, marital status, employment, source of hospital referral and the presence of schizophrenia in the family were concerned (Tab. 3).

**Table 3.** Comparison of data regarding the course of the illness in the studied and control group of women. Differences between the groups were statistically relevant at the level  $p < 0.05$ .

Course of the illness	Studied group	Control group	p
Age of the onset of schizophrenia*	30.57 (2.29)	28.20 (2.21)	$p = 0.4630$
Age of the first hospitalisation due to schizophrenia	34.87 (2.22%)	29.99 (2.22%)	$p = 0.1352$
Occurrence of schizophrenia in patient's family	3 (20%)	5 (33.33%)	$p = 0.893$
Number of hospitalisations	6.50 (1.70)	8.16 (1.70)	$p = 0.5019$

b) Comparison of clinical scales.

The average score in the PANSS scale, evaluating the intensification of negative and pos-

itive symptoms was similar in both groups. In the scale of general symptoms, the variations in relation to general symptoms were particularly demonstrated in reference to the intensity of depression. The studied group obtained higher values, which meant that the intensity of mood disorders in the group of women ill with schizophrenia and dependent on alcohol was considerably higher in comparison to the control group. This data correlated with the results obtained with the use of the Hamilton Depression Rating Scale (Tab. 4).

**Table 4.** Comparison of clinical scales in the studied and control groups of women. The differences between the groups were statistically relevant at the level  $p < 0.05$

Clinical Scales	Studied group		Control group		p
	Average	SD	Average	SD	
PANSS - NEGAT	24.86	0.13	24.73	0.20	$p = 0.7105$
PANSS - POSITIVE	21.20	0.06	19.60	0.26	$p = 0.4354$
PANSS - GENERAL	50.60	0.12	47.33	0.12	$p = 0.4125$
SPP*	57.33	0.28	74.20	0.28	$p = 0.0843$
Hamilton's Scale*	17.33	0	10.33	0.53	$p = 0.0156$

### c) Comparison of the evaluation of alcohol dependence

The age of the beginning of the alcohol dependence in the group of women was on average 32. The abuse of alcohol in the family was significantly more frequent than in the control group: 53% of women had at least one parent with an alcohol problem, as opposed to 0% in the control group:  $p = 0.0015$ . This correlates with the earlier onset of alcohol dependency and higher values in the MAST test ( $r = -0.483$ ,  $p = 0.068$ ). Chronologically, schizophrenia preceded alcohol dependency in the case of 11 women. 4 other women had been addicted to alcohol prior to the occurrence of the first symptoms of schizophrenia ( $p = 0.01$ ).

### III. Comparison of the studied groups of men and women (with the diagnosis of schizophrenia and alcohol dependency)

The age at which patients became ill with schizophrenia and the age of their first hospi-

talisation were later in the group of women, but the discrepancies did not reach the level of statistical relevance. The level of the occurrence of alcohol addiction in the family was similar in both groups. The statistically highly relevant difference was only in respect of the beginning of alcohol addiction, which was clearly later in the group of women (women – 32.1; men – 26.2;  $p = 0.004$ ).

## DISCUSSION

In our study, the studied and control groups, both in case of men and women, did not differ demographically, whereas Soyka et al. noted that the group of patients with a dual diagnosis in their study was dominated by single men, in difficult housing situations and in conflict with their families [22]. Similar results, with respect to dual diagnosis patients' marital status were obtained in the 1989 study conducted by Drake and his colleagues [1]. The lack of these differences in our study may be explained by Polish society's high tolerance of persons addicted to alcohol and of schizophrenic men. Alcohol addiction and various related conflicts is very seldom a barrier to setting up a family; it also very rarely leads to social isolation or homelessness.

Amongst men with a dual diagnosis, the age of the onset of schizophrenia was later than in the control group. Similar results were demonstrated in the study conducted by Duke et al. They explained the reasons behind these differences by the impact of alcohol abuse on the early stages of schizophrenia. In their opinion, alcohol reduces the discomfort arising in the initial stages of psychosis and can successfully mask the symptoms of a developing mental illness, and hence the delay in its diagnosis and treatment [23]. Nordsy et al. hold a similar view: they discuss the cases, in which alcohol played a significant role in reducing auditory hallucinations, through its influence on the accompanying symptoms, such as anxiety and tension [24]. An important role in the "masking" of mental illness symptoms is played by the sedative and euphorising properties of alcohol which are used by schizophrenic patients for "self-treatment" [25, 26, 27, 28]. Also, the majority of our patients, when asked about alcohol abuse, have in fact mentioned its

usefulness in improving one's mood and self-esteem (65%). As many as 72% of men with a dual diagnosis have also emphasized the usefulness of alcohol in facilitating social contacts. Summarizing the results obtained thus far, it can be clearly stated that the mechanism of "self-treatment" seems to be an important factor in delaying the occurrence of the symptoms of schizophrenia, but only in the case of men. It is only in the group of men that the chronological analysis of both dysfunctions revealed that alcohol dependency had much more frequently preceded the first episode of mental illness. In the group of women with a dual diagnosis, alcohol addiction usually developed against the background of a fully developed schizophrenia, and therefore it did not affect the initial stages of psychosis.

The occurrence of alcohol dependency in the mentally ill patients' families has been a subject of scientific studies for many years. The studies revealed that just as in the case of general population, alcohol abuse in the family, does encourage alcohol dependency later on in people diagnosed with schizophrenia [29, 30, 31]. However, as opposed to the healthy population, where this aspect refers mostly to men, in our study some significant observations have been made in reference to women. The presence of alcohol dependency in the families of women with a dual diagnosis has been much more frequent, which may point out towards the reasons for alcohol dependency in this group of patients to be mostly environmental.

Also the clinical picture of schizophrenia in the case of patients addicted to alcohol has been a subject of many studies [32, 33, 34]. Alterman's studies show that in this group of patients there is a prevalence of productive symptoms, especially auditory hallucinations [32]. The results of our research have not confirmed this observation. The differences between the data obtained in our research and the results of other studies, which demonstrated a higher intensification of productive symptoms in the patients with a dual diagnosis, might lie in different stages at which the evaluations were carried out. For the purposes of this study, most of the patients were evaluated in the second week of hospitalisation. It may be that the time that has elapsed from the last alcoholic drink that our patients have had and the treatment used in the hospital could sig-

nificantly affect the clinical picture of the illness. We have, however, obtained statistically relevant results in connection with the negative symptomatic, which turned out to be less intense in the studied group of men when compared with the control group. This complies with earlier reports on this subject. Weaker expression of defective symptoms might have been the reason behind using mostly typical neuroleptics in the treatment of this group of patients, whereas in the control group, the treatment was dominated by the new generation of anti-psychotic drugs. Arndt et al [35] have also demonstrated that patients with better premorbid adjustment reach for alcohol and other psychoactive substances more frequently. They are characterized by more effective social skills and much less intense deficit symptoms. In our studied and control groups, we have noticed a reverse dependence of high statistical relevance between the results of the SPP scale and the intensification of negative symptoms. Among the women and men with a dual diagnosis, the premorbid adjustment was better and the level of negative symptoms in men was lower in comparison with the control group. Based on our research we can conclude that one of the reasons behind alcohol dependency in the group of people ill with schizophrenia is a more effective functioning of patients in the premorbid period. This is of course linked with the ability to establish social relations, also those that serve the searches for "drinking" circles. The authors such as Bowie et al. think that the reason behind the lower level of deficit symptoms in the group of patients with a dual diagnosis lies in patients' young age at the time of research (similarly to our research). The analysis of cognitive functions that they have carried out in a more advanced age group i.e. in the group of patients aged between forty and eighty revealed the presence of memory deficits, the impairment of adaptive skills and higher intensification of negative symptomatic in relation to the persons with a single diagnosis of schizophrenia [33].

Women with a dual diagnosis did not differ in comparison to the control group as far as the intensification of the productive and deficit symptoms is concerned. They did, however, obtain higher scores in the PANSS general symptoms scale and the Hamilton's Depression Scale. Based on these results we can assume that mood

disorders are characteristic for this group of patients, even if their aetiology remains uncertain. It seems likely that it is originally low mood that might be the reason behind these women reaching for alcohol for self-treatment. The hypothesis complies with Cloninger's position [36] who thinks that alcoholism amongst women with a mental disorder is usually secondary, as it originates in relation to the symptoms of the primary illness; in this case schizophrenia. It cannot be ruled out, however, that symptoms of depression in this group of patients appear as a result of long term use of alcohol, although this type of aetiopathogenesis is found more characteristically in men.

Summarizing the results of our work and also the data obtained in other studies, we conclude that many of the issues relating to dual diagnosis require further research. The latest reports point us out towards the need to discuss the assumptions formed earlier. The concept of self-treatment in schizophrenia certainly requires revision as it is not always that alcohol abuse relates to the reduction of the symptoms of mental illness; many cases have been described of it actually intensifying the symptoms [33, 37, 38]. It seems more likely that the reason behind both illnesses may lay in common biological background, such as the hypofunction of dopaminergic and opioid systems, which similarly to schizophrenia and alcohol dependence reveals itself in women and men at different age. We should not be surprised by a frequent coexistence of schizophrenia and alcohol dependency because dopamine and endogenous opioids are responsible for the correct functioning of the reward and punishment centre and the prefrontal area [25]. The neurobiological concept and the concept of self-treatment do not, however, exhaust the range of all possible explanations of the reasons for a dual diagnosis. Further research is required which will expand the data we have with the analysis of other factors contributing to the original predisposition to addiction observed in schizophrenic patients. This type of research should especially involve schizophrenic women who are dependent on alcohol, in which case, the environmental factor plays a crucial role. Apart from the cognitive value of such research, it may also contribute to working out of more effective prophylactic and treatment programmes addressed to var-

ious groups of patients with a dual diagnosis of alcoholism and schizophrenia.

## CONCLUSIONS

Patients with the diagnosis of schizophrenia and alcohol dependency (dual diagnosis) differ from the patients with the diagnosis of schizophrenia who are not addicted to alcohol in many clinical aspects, mainly:

- a) later onset of schizophrenia in men dependent on alcohol
- b) more frequent occurrence of alcohol dependency in the family, especially in relation to women
- c) lower intensification of negative symptoms of schizophrenia among men
- d) higher intensification of depression symptoms in the group of women

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