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COMORBIDITY OF HARMFUL USE OF ALCOHOL IN POPULATION OF SCHIZOPHRENIC PATIENTS

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SUMMARY

Background: *Numerous studies carried out during the last twenty years point to an increase of co-morbidity of harmful use of alcohole caused disorders in the population of schizophrenic patients. The results show rate of this kind of co-morbidity between 35 and 80%. The aims of the investigation are: establishing frequency of harmful use of alcohol in the patients with diagnosis of schizophrenia, observed against the population statistics data; determination of possible predictors of harmful use of alcohol in the population of schizophrenic patients (adolsecent bihevioural problems, child neuroticism); determination of heritage role in the development of the both nosologic entities and the analysis of the outcomes of harmful use of alcohol in the population of schizophrenic patients (suicide attempts, cognitive impairment).*

Subjects and methods: *The population included 50 inpatients between 20 and 50 years, with primary diagnosis of schizophrenia. Diagnostic procedure was carried out by application: Structured clinical interview ICD 10 (Mini International Neuropsychiatric Interview), Structured questionnaire for the assessment characteristics and effects of harmful use of alcohol in the population of schizophrenics - modified version, Mini mental state scale and Heteroanamnestic questionnaire. Comparison was made between the patients with schizophrenia and the patients with co-morbidity.*

Results: *The results revealed significantly higher rate harmful use of alcohol co-morbidity in the male population. There is a prominent significant difference in alcoholism heritage in co-morbidity group. A statistically significant difference between the sub-groups was found in the frequency of child neuroticism and adolescent behavioral problems. The results point to a higher suicidal risk and higher rate of cognitive impairment in the co-morbidity sub-group.*

Conclusions: *Young male with schizophrenia and family history of alcoholism are especially susceptible by this type of co-morbidity. Presence of child neuroticism may represent „protective factor" for development of harmful use of alcohol. The study stressed some serious consequences of this type of co-morbidity: increase rate of suicide attempts, as well as more frequent development of organic brain tissue impairment.*

Key words: *co-morbidity – schizophrenia - harmful use of alcohol*

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INTRODUCTION

Co-morbidity in psychiatry represents simultaneous existence of two or more disorders, regardless of the sequence in their appearance. Determination of the basic and co-morbid disorders is not performed on the basis of their onset, but on the basis of their potential to impair psychical health and the functioning of a personality. Contemporary literature uses the term "dual diagnosis" to describe co-morbidities in individuals, which, beside a serious mental disease (e.g. schizophrenia), also fulfill diagnostic criteria for harmful use/abuse or addiction of some psychoactive substance (e.g. alcohol). Within the population of patients from the "dual diagnosis" category, a clinician frequently meets diagnostic dilemmas, especially in the start, where the complexity of the clinical presentation may lead to a wrong diagnosis of these disorders, and thus to an inadequate treatment. Numerous studies, performed during the last twenty years, indicate an increase of co-morbidity of disorders caused by harmful use or abuse of alcohol and other psychoactive substances in the population of schizophrenic patients (Miettunen et al. 2009, Chen & Somers 2008). Generally, the results of investigations across the world show the range of this kind of co-morbidity varying between 35 and 80 percent, in dependence on the methods used and on geographic location of the areas of investigation (Brown et al. 2000).

During the last two decades, attempts have been intensified to discover the connection between schizophrenia and harmful use of alcohol, which is the second most frequent form of co-morbidity in schizophrenic patients, next to the nicotine abuse (Mueser 1990). This category of patients may be very complex for diagnosis and therapy (bringing the right diagnosis and very specific in therapeutic sense). Also, the patients are prone to more frequent relapses, leading to more frequent hospitalizations. They display more serious form of the main disease with more complications (Helzer & Pryzbeck 1998). As for the etiology of co-morbid disorders, modern psychiatry offers only

hypotheses and theories which do not yet confirm the definite cause of this type of combined appearance of two or more different entities.

The aims of the investigation were: establishing frequency of harmful use of alcohol in connection with population statistics characteristics: determination of possible predictors of harmful use of alcohol in the population of patients with the primary diagnosis of schizophrenia (adolsecent bihevioural problems, child neuroticism); determination of heritage in the both nosological entities and the analysis of the consequences of harmful use of alcohol in the population of schizophrenic patients (suicide attempts, cognitive impairment).

SUBJECTS AND METHODS

The study population included 50 inpatients, between 20 and 50 years, treated from psychotic disorders (during 2006-2009) at the Psychiatry Clinic of the Clinical Center of Serbia and Special Hospital for Psychiatric Disorders "Kovin". Each of these patients had at least one hospitalization before the one that made them available for this investigation. Before inclusion in the investigation process, all patients voluntarily signed the informed consent for participation in the study, which was previously approved by ethical committee. All of the patients passed clinical-diagnostic assessment performed immediately after admission to the hospital treatment, by the application of the following diagnostic instruments: Structural clinical interview ICD 10 for the confirmation of the diagnosis of the existing psychiatric disorder – schizophrenia and harmful use of alcohol (Mini International Neuropsychiatric Interview - MINI), Structured questionnaire for the assessment of the characteristics and effects of harmful use of alcohol in the population of schizophrenic patients - modified version (Vučković et al. 1984). The questionnaire include, beside data about harmful use of alcohol patterns (what is mentioned in title) questions about child neuroticism (nightmares, nocturia, nail biting), adolsecent bihevioural problems (running away from home and school, educational problems, violent bihevioral patterns, deliquency), as well as records about depression, suicidality and cognitive impairment.

Mini mental state examination scale (MMSE) and Heteroanamnestic questionnaire constructed for this occasion and intended for the relations of the patients with the aim of evaluation and determination of the pattern and characteristics of harmful use of alcohol in the study population. Comparison is carried out in accordance with the variables from the questionnaire between the sub-groups of the study population, e.g. between the patients with diagnosis of schizophrenia and those with dual diagnosis. For statistical analysis were applied procedures of Statistical Package for the Social Sciences - SPSS.

The independent variables were following: demographic records (sex, age, marital status, and education), clinical diagnoses of main psychiatric disorder (schizophrenia, harmful use of alcohol), heritage, child neuroticism, adolsecent bihevioural problems, while the dependent variables were suicide attempts and the level of cognitive impairment.

The following descriptive methods of statistics were applied for the purpose of statistical analysis (mean values, variability measures), statistical testing of hypotheses (Chi-square test, Mann Whitny U test), certain types of multivariate analysis (multivariate test and logistic regression). The level of hypothesis testing significance was 0.05. For multivariate analyses we applied Bonferoni correction which determines statistical significance as a quotient of the total significance level and the number of variables.

RESULTS

In accordance of the population statistics it may be seen that the occurrence of harmful use of alcohol co-morbidity is significantly higher, actually eight times, in the male population of schizophrenic patients than in the female one. In the sub-group without co-morbidity the male/female ratio is 47.83%:52.17%, and in the co-morbidity group it is even 88.89%: 11.11% (Table 1).

Table 1. Distribution of subject according to sex in the study population

Sub-group	Distribution of subjects according to sex		
	Male	Female	Sum
F20/F10.1	24	3	27
Column %	68.57%	20.00%	
Row %	88.89%	11.11%	
Total %	48.00%	6.00%	54.00%
F20	11	12	23
Column %	31.43%	80.00%	
Row %	47.83%	52.17%	
Total %	22.00%	24.00%	46.00%
Total	35	15	50
Total %	70.00%	30.00%	100.00%

From the aspect of marital status, no statistically significant differences were found between the sub-groups of the sample population, with a high prevalence of unmarried individuals in the both sub-groups. Similarly, on the basis of the test statistics values, no significant intergroup difference was found in connection with educational status of the subjects in the sample population.

The overall impact of heritage in the study population amounted to 68%, whereby this value was 52.17% in the sub-group without co-morbidity, and even 81.48% in the co-morbidity group (Figure 1). As for schizophrenia as heritage factor, no significant intergroup difference was found. Positive heritage of this kind was found in 48.15% of schizophrenic patients

with the co-morbidity of alcohol abuse and in 47.83% of those without co-morbidity (Figure 1).

When considering alcoholism as heritage factor, there is a prominent statistically significant difference between the sub-groups. The sub-group of schizophrenic patients with co-morbidity has significantly higher rate of alcoholism heritage in comparison with the sub - group of schizophrenic without co-morbidity. Alcoholism heritage burden was found in 44% of the total population, whereby the prevalence of this burden is 77.78% in the co-morbidity sub-group, and only 4.35% in the sub-group without co-morbidity (Figure 1).

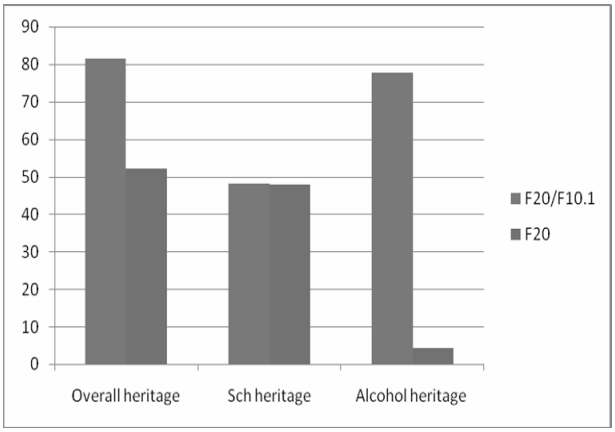

Figure 1. Impact of heritage in study population

In the case of child neuroticism, statistically significant difference was found in the frequency of neurotic symptoms in childhood occurrence between the sub-group with the co-morbidity of alcohol abuse and the sub-group without the co-morbidity. The ratio of 43.48%: 56.52% was found between the frequencies of symptoms of child neuroticism occurrence in the sub-groups in favor of the sub-group without co-morbidity (Table 2).

Table 2. Frequency of child neuroticism in the study population

Sub-group	Early neurotic problems		
	Yes	No	Sum
F20/F10.1	12	15	27
Column %	48.00%	60.00%	
Row %	44.44%	55.56%	
Total %	24.00%	30.00%	54.00%
F20	13	10	23
Column %	52.00%	40.00%	
Row %	56.52%	43.48%	
Total %	26.00%	20.00%	46.00%
Total	25	25	50
Total %	50.00%	50.00%	100.00%

Adolsecent bihevioural problems occur in the total sample population with the frequency of 62%. In the sub-group without co-morbidity this frequency is 82.61, while in the population with co-morbidity it is 44.44% (Table 3).

Table 3. Frequency of adolescence behavioral problems in the study population

Sub-group	Maladaptive behavior in adolescence		
	No	Yes	Sum
F20/F10.1	12	15	27
Column %	38.71%	78.95%	
Row %	44.44%	55.56%	
Total %	24.00%	30.00%	54.00%
F20	19	4	23
Column %	61.29%	21.05%	
Row %	82.61%	17.39%	
Total %	38.00%	8.00%	46.00%
Total	31	19	50
Total %	62.00%	38.00%	100.00%

The obtained results of statistical assessment indicate statistically highly significant difference in the frequency of suicide attempts between the compared sub-groups, as well as significantly higher threatened suicides in the sub-group of schizophrenic patients with co-morbidity, in comparison with the sub-group without co-morbidity (Table 4).

Table 4. Distribution of suicide attempts in the study population

Sub-group	Suicide attempts		
	Yes	No	Sum
F20/F10.1	15	12	27
Column %	78.95%	38.71%	
Row %	55.56%	44.44%	
Total %	30.00%	24.00%	54.00%
F20	4	19	23
Column %	21.05%	61.29%	
Row %	17.39%	82.61%	
Total %	8.00%	38.00%	46.00%
Total	19	31	50
Total %	38.00%	62.00%	100.00%

Table 5. Distribution of cognitive impairment in the study population

Sub-group	Cognitive impairment		
	Yes	No	Sum
F20/F10.1	24	3	27
Column %	51.06%	100.00%	
Row %	88.89%	11.11%	
Total %	48.00%	6.00%	54.00%
F20	23	0	23
Column %	48.94%	0.00%	
Row %	100.00%	0.00%	
Total %	46.00%	0.00%	46.00%
Total	47	3	50
Total %	94.00%	6.00%	100.00%

Comparison of cognitive impairment rate revealed a statistically significant difference between the sub-groups. A low percent of organic lesions was found in the total population and it amounted to 6%. However, in the sub-group of schizophrenic patients with harmful use of alcohol co-morbidity this share was 11.11%, while in the sub-group without comorbidity it was 0% (Table 5).

DISCUSSION

The previous studies indicate an increase of co-morbidity in the population of schizophrenic patients (Soyka et al. 1993). The diagnosis of this category of patients should be very careful, especially at the very beginning of the disorder. The existence of two psychiatric entities frequently may confuse clinician because of the symptoms overlapping, mutual obscuring and modifications of the main psychiatric symptoms.

In our study, harmful use of alcohol co-morbidity amounted to 54% in the sample population. Similar co-morbidity rates were found in lot of previous studies, whereby the prevalence of disorders ”associated with alcohol abuse” in individuals with primary diagnosis of schizophrenia varied between 40 and 70% (Regier et al. 1990, Blanchard et al. 2000, Buckely 2002). The research showed that outstanding risk for occurrence of this form of comorbidity is encountered with younger male individuals with the diagnosis of schizophrenia with background of alcoholism heritage burden (Hambrecht & Häfner 1995). Total psychiatric heritage burden in the study population amounted to 68%. However, an indicator of possible occurrence of co-morbidity has significantly higher percent of heritage in the sense of an existing diagnosis of harmful use of alcohol in the family background of schizophrenic patients. With such individuals, there is a higher percent of the development of complex clinical presentation, so-called “dual diagnosis”. According to previous research, it is possible to assume that there is a link between the etiology of schizophrenia and alcohol abuse (Cantor-Graae 2002). Based on current knowledge, it may be only assumed that psychotic disorders heritage has no impact on the formation and development of co-morbid alcohol abuse in the population of schizophrenic patients (Krystal et al. 2006). About 50% of subjects involved in study reported some sort of neurotic symptoms in the early childhood. Our study confirmed that signs of child neuroticism were significantly more frequent in the sub-group of schizophrenic subjects without the co-morbid harmful use of alcohol. This unexpected result leads to the assumption that the presence of child neuroticism may be connected with less frequent occurrence of co - morbidity, which means that the individuals in this category are somehow “protected” from harmful use of alcohol. Although this looks like a paradox, child neuroticism may represent a “protective" factor for appearance and development of maladaptive patterns of alcohol use if a person develops schizophrenia at a later age. Recent studies tried to find biological link between these two entities, but it is still not sufficiently clear and requires more detailed and extensive investigations (Carey 2009). It has been shown that some factor, including child neuroticism, may condition a specific behavioral set in persons developing schizophrenia at a later age, which is manifested in an inclination towards social isolation and avoiding all forms of psychoactive substance abuse, including that of alcohol (Volkow et al. 2009).

It is a common finding that the individuals with predisposition to develop some of psychotic disorders at their adult age have certain maladaptive behavior patterns in their adolescence (Conner 2004). However, our investigation did not reveal any connection between adolescent behavior problems and higher probability of harmful use of alcohol co-morbidity in the population of schizophrenic patients. Investigations with completely different conclusions have been published, such as the study stating that 64% of the population of schizophrenic patients with alcohol abuse co-morbidity had at least one of the mentioned behavior problems in adolescence (Cuffel & Chase 1994). In any case, future investigations should clarify the relationship between behavior problems in adolescence and their possible later impact on the development of harmful use of alcohol co-morbidity in the population of schizophrenic patients.

Suicide attempts were three times more frequent in the sub-population of the patients with co-morbidity. Attempted suicides were significantly more frequent at the onset of the disease, as well as during remissions, probably due to balancing , but also due to development of post-schizophrenic depression. Schizophrenic individuals more easily become trapped in “desperate” situations and more frequently develop demoralizing syndrome, which all may precede a suicide (Leposavić 1997). There are numerous studies indicating that suicide is significantly higher in the population of schizophrenic patients with co-morbid diagnosis of alcohol abuse (Roy et al. 1984, Blanchard et al. 2000). This is explained by higher vulnerability rate caused by “dual diagnosis”, but also the specificity of neurobiological correlates taking part in the onset of both schizophrenia and harmful use of alcohol. First of all, hyperactivity of dopamine transmission in certain brain structures, but a possible impact of glutamate links in the brain also is not neglected (Chambers et al. 2001).

Analysis of the results including a rough assessment of cognitive impairment indicated, most of all, a comparatively low percent of cognitive impairment participation in overall study population (only 6%). One of the possible reasons may be low test sensitivity. Inter-group difference in the existence of cognitive impairment was highly significant, pointing to a higher degree of organic damage in the group with harmful use of alcohol co-morbidity. Brain damages caused by schizophrenic process by itself are additionally worsened by neurotoxicity of alcohol.

CONCLUSIONS

On the basis of the set aims, the following conclusions may be achieved:

- In patients with schizophrenia there is a high frequency of co-morbid diagnosis of harmful use of alcohol, which especially prevails in younger male individuals, while marital status and education did not show any impact on the occurrence of dual diagnosis.
- Child neuroticism have predictive significance for co-morbidity in this population in the sense that the existence of neurotic symptoms in childhood represents, paradoxically, a "protective" factor in the case of harmful use of alcohol co-morbidity. Adolescent behavioral problems do not have impact on the prediction of co-morbidity in the population of schizophrenic patients.
- Heritage of alcoholism may be recognized as a specific predictor for the occurrence of harmful use of alcohol co-morbidity. Also, a higher degree of overall heritage was found in the sub-population of the patients with harmful use of alcohol co-morbidity in the population of schizophrenic patients, than in the sub-population without co-morbidity.
- Suicide attempts occur significantly more often in the sub-population of schizophrenic patients with harmful use of alcohol co-morbidity. Also, the degree of cognitive impairment is significantly higher in the sub-population of schizophrenic patients with harmful use of alcohol co-morbidity.

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