

## Gender-related prognostic factors in first admission DSM-III schizophrenic patients

Aneta Kalisz, Andrzej Cechnicki

Adult Psychiatry Clinic, Collegium Medicum, Jagiellonian University, Kraków  
Head of the Clinic: Prof. Andrzej Zięba

*The paper presents gender-related prognostic factors in first admission DSM-III schizophrenic patients. The evaluation was made during their first admission.*

*Key words:* prognostic factors, gender, schizophrenia

### Introduction

The multiform clinical manifestations of schizophrenia prompt one to seek factors that together could contribute to this multiformity. Such a factor, whose significance has been long recognised but is still debated, is gender.

In his survey of specialist literature on the differences between male and female schizophrenic patients, Levin [1] stresses that before the onset of the illness men generally do not function socially so well, they are hospitalised at an earlier age, their negative symptoms are more intense and the illness in them takes a more severe course. In 1990, in the article that opened the issue of *Schizophrenia Bulletin* that was devoted to gender differences in schizophrenia, Goldstein and Tsuang [2] summed up the hitherto research results and listed the following as basic differences concerning schizophrenic male patients: the earlier onset of the illness and the earlier hospitalisation, worse functioning before the illness, more intense negative symptoms, a more severe course, worse response to neuroleptic medication, less frequent occurrence of familial schizophrenia, and a larger number of structural and functional brain micro-abnormalities.

The 'earlier beginning' of schizophrenia in men is the most frequently underlined difference, which was manifested already in Krepelin's description of *dementia praecox*, and it is not connected with cultural influences. Angermeyer et al. [3], having surveyed the literature, found almost 50 researches that confirmed this difference. The term 'beginning of the illness' is, however, imprecise. In their article [4], Häfner et al. compared the difference of age between women and men at various points of time that were identified as the beginning of schizophrenia. Regardless of whether

these were 'the first non-specific symptoms', 'the first negative symptoms', 'the first positive symptoms', 'the maximum intensity of positive symptoms' or 'the first hospital admission', the difference was statistically significant: women were invariably older. The same authors [quoted after 5], quoting the above mentioned cross-cultural invariability of this factor, similarly as Seeman and Lang [6] or Loranger [7] propose to adopt a biological hypothesis to explain the difference. In their opinion, it stems from the protective quality of estrogens, which diminish the sensitivity of D2 receptors. This hypothesis is supported by the fact that [4] in women the risk of developing schizophrenia increases after the age of 45. There also exists an opinion [8] that in familial schizophrenia there are no gender differences in the age at the onset of the illness. Another difference that is often mentioned in specialist publications is the better premorbid functioning of women [2, 3, 9]. At onset, women have better social contacts, better education, usually they are permanently employed, have already left their family home, got married or have a stable relationship. What is accentuated is the potential connection between these differences and the age in which patients become ill, because women, as older, have had a better chance to adopt new social roles.

As to psychopathology, the authors observe more intense negative symptoms in men and more intense affective symptoms in women [1, 10, 11]. Some researchers [12] ascribe the differences to imprecise diagnosis or to the side effects of the higher doses of neuroleptics that are prescribed to men. Among other repeatedly quoted differences one should enumerate the more frequent occurrence of schizoid personality disorders [13, 14], cerebral micro-abnormalities [2, 15] and poor response to treatment [14] in the case of men.

The Kraków prospective longitudinal study on the course of schizophrenia defined also a number of more detailed research goals, including the evaluation of the role of gender in prognosis and treatment results. In earlier publications [5, 16] we presented our particular research goals, the study group, the tools and method. Thus they will be referred to only in the context of the research issues posed herein. The study commenced in 1986-7, hence the diagnostic criteria applied in it are based on the DSM-III classification.

### **The aim of the study**

The aim of this study is to evaluate the differences in prognostic factors in men and women at the onset of schizophrenia, diagnosed on the basis of the DSM III criteria.

### **The study group**

The study group at the beginning of the project embraced 80 patients. The qualifying criteria were: first hospital admission, schizophrenia diagnosed according to DSM-III, permanent residence in Kraków. Women constituted 58% and men 42% of the study group.

### **Tools**

All the information about the group was included in the chart of independent predictors which is a modified Carpenter-Strauss chart. To evaluate psychopathological symptoms, Overall and Gorham's Brief Psychiatric Rating Scale was used, Los Angeles modification (BPRS-LA).

To evaluate social functioning, Słupczyńska's Social Activity Scale was used, which contains eight domains (paid work, work on a farm, education, housework, independence, participation in family life, parental role and social contacts) and criteria of DSM-III, dimension V which concern employment, social contacts and leisure activities.

### Method

In order to measure the results statistically, the following tests were used: t-test, Mann-Whitney's test, median test,  $\chi^2$  test.

### Results of the study

The differences between male and female patients as to the selected prognostic factors, especially the statistically significant differences and notable trends are described below. Among the prognostic factors, eight areas were distinguished, as in the following [5]:

1. Demographic predictors: gender, marital status, education, age at first hospital admission.
2. Premorbid personality: premorbid personality acc. to DSM-III.
3. Family predictors: schizophrenia-related disorders among relatives, index of expressed emotions.
4. Premorbid social predictors: social contacts outside the family, employment/education, sexual adjustment, social functioning acc. to DSM-III (dimension V), social functioning acc. to SAS, Surtees's index of social network.
5. Premorbid predictors: 'important life events': triggering factor acc. to DSM-III.
6. First episode predictors: patient's age at onset, time between onset and 1<sup>st</sup> hospitalisation, 1<sup>st</sup> attack of illness, onset of illness (acute or protracted).
7. First hospitalisation predictors: type of schizophrenia acc. to DSM-III, duration of 1<sup>st</sup> hospitalisation, hebephrenic symptoms at admission, catatonic symptoms at admission, formal thought disturbances at admission, affective symptoms at admission, psychopathology at admission acc. to BPRS, negative symptoms at discharge after 1<sup>st</sup> hospitalisation acc. to BPRS, psychopathology at discharge after 1<sup>st</sup> hospitalisation acc. to BPRS.
8. Biological predictors: enlargement of CSF spaces in the central nervous system (computed tomography examination).

### Demographic predictors

Among the gathered demographic data, no statistically significant gender differences occur. Consistently, however, women are more frequently married, they are better educated and they usually have moved out from their family home. The results are shown in Table 1 below.

### Family predictors and premorbid personality

Table 1

#### Gender differences: demographic predictors

Demographic predictors		Women n=46	Men n=34	P*
Marital status	Married	41%(19)**	24%(8)	n.s.
	Divorced	0%	0%	
	Single	59%(27)	76%(26)	
Education	Higher	33%(15)	24%(8)	n.s.
	Secondary	52%(24)	41%(14)	
	Primary & vocational	15%(7)	35%(12)	
Household	Procreative family	37%(17)	12%(4)	n.s.
	Procreative & generational family	2%(1)	9%(3)	
	Outside the family	7%(3)	9%(3)	
	Generational family	54%(25)	70%(23)	

\* to evaluate differences between groups, Mann-Whitney's test was used

\*\* in brackets: number of patients

A statistically significant difference here is that schizoid and schizotypal personality disorders occur in men almost twice more frequently. The difference in the occurrence of schizophrenia-related psychoses among the patient's relatives is not statistically significant, although it is clear: it is men who suffer from them twice more frequently as well. Both in men and women, when the expressed emotions' index was investigated, no emotional involvement and/or hostility was observed in the case of one-third of the families. The composite sampling of the expressed emotions index, conducted by M. Roztworowska [17], was described in more detail in our earlier publications. The results are shown in Table 2.

### Social predictors

Table 2

## Gender differences: family predictors &amp; premorbid personality predictors

Family predictors, premorbid personality		Women N=46	Men n=34	p*
Inheritance	Present	26%(12)	56%(19)	n.s.
	Absent	74%(34)	44%(15)	
Expressed emotions index**	No emotional involvement or hostility	33%(14)	34%(10)	n.s.
	Emotional involvement	24%(10)	17%(5)	
	Hostility	33%(14)	21%(6)	
	Emotional involvement & hostility	10%(4)	28%(8)	
Premorbid personality	Normal personality	63%(29)	36%(12)	p=0.02
	Schizoid & schizotypal personality	20%(9)	40%(13)	
	Other personality disorders	17%(8)	24%(8)	

\* to evaluate differences between groups,  $\chi^2$  test and Mann-Whitney's test were used

\*\* data collected in a group of 42 women and 29 men

In the evaluation of premorbid social functioning we used six indexes: three scales of a greater degree of complexity and a clinical evaluation of three domains that are important in social functioning.

Comparing premorbid social predictors, we observed two statistically significant differences in social functioning when evaluated clinically according to the DSM III criteria (dimension V) and according to the clinical evaluation of social contacts. Both groups of results are graphically presented in Figure 3a and 3b.

On the other hand, we did not find statistically significant differences in the social functioning of men and women when evaluated on the basis of the SAS scale. Similarly, when using Surtees's index of social network, which defines the quality of social contacts in seven domains (total score: 15 points; the increasing values correspond with greater psychopathology), and when clinically evaluating employment and education, we did not observe significant differences (Table 3).

The study group included no patients with the highest level of social functioning. The most perceivable gender difference relates to very good social functioning: four times more women than men were classified here. The number of women whose social functioning was evaluated as poor or very poor was twice as low as the number of similarly classified men.

What is noticeable in the comparison of the clinical evaluation of men's and women's social contacts is that twice more men than women have no social contacts

Table 3

## Gender differences: premorbid social predictors

Social predictors		Women n=40	Men n=33	p*
Level of social functioning acc. to DSM-III, dimension V		Fig. 3a**	Fig. 3b	**p=0.002
Index of Social Ties acc. to Surtees		Average d. 3 points s. d. 3.5	Average 7.7 points s. d. 2.5	n. s.
Level of social functioning measured with the use of The Social Activity Scale		Average 59 points s. d. 12.2	Average 50.5 points s. d. 10.5	n. s.
Work/education, clinical evaluation	Full-time work	80%(40)	70%(21)	n. s.
	Part-time work	4%(2)	0%(3)	
	No employment	7%(3)	12%(4)	
Social contacts before 1 <sup>st</sup> admission (number & satisfaction rate)		Fig. 3b***	Fig. 3b	**p=0.006
Premorbid sexual adjustment	No adjustment	47%(19)	58%(19)	n. s.
	No stable relationship	18%(8)	18%(6)	
	Stable relationship	47%(19)	24%(8)	

\* to evaluate differences between groups, t test and Mann-Whitney«s test were used

\*\* data on the level of social functioning acc. to DSM-III, dimension V, are presented in detail in Fig. 3a

\*\*\* in brackets: standard deviation

and thrice more men than women describe their social contacts as unsatisfactory. A contrary trend was observed among women: twice more of them were among the patients who had satisfactory social contacts.

## First episode predictors

In this group of predictors we identified one statistically significant difference: the first symptoms of the illness occur in women later. The age at the first hospital admission, the lapse of time between the onset of the illness and the hospitalisation, and the character of the onset of the illness did not prove to be gender-related. For 80% of the patients, both men and women, the first hospitalisation was connected with the first episode of the illness. The results are shown in Table 4.

What is perceivable in the compiled data is the lack of statistical significance despite the clear difference (14 weeks) between men and women as to the duration of time between the onset of the illness and the first hospitalisation. This difference, however, was due to the fact that the study group included a male patient for whom this lapse of

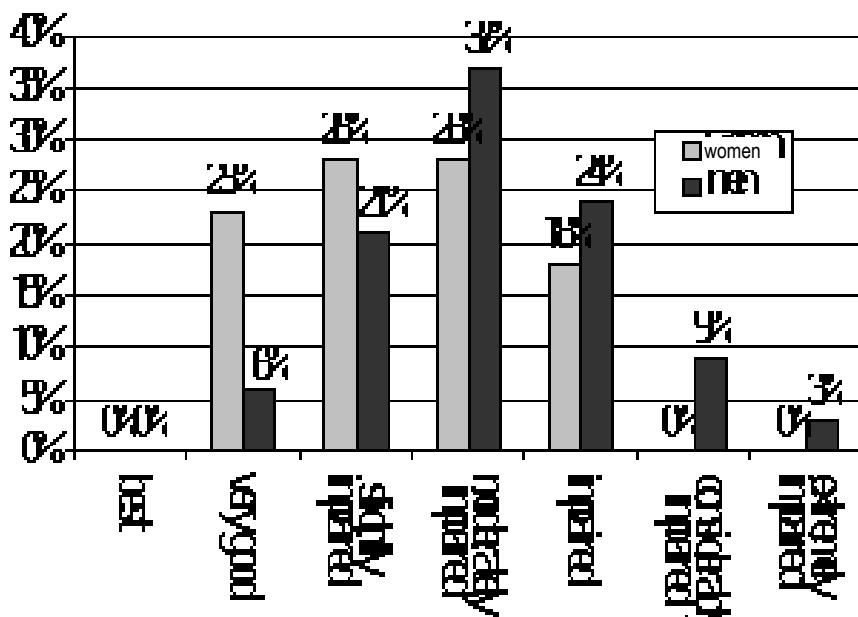


Figure 3a Comparison of men's and women's social functioning as clinically evaluated acc. to DSM-III, dimension V

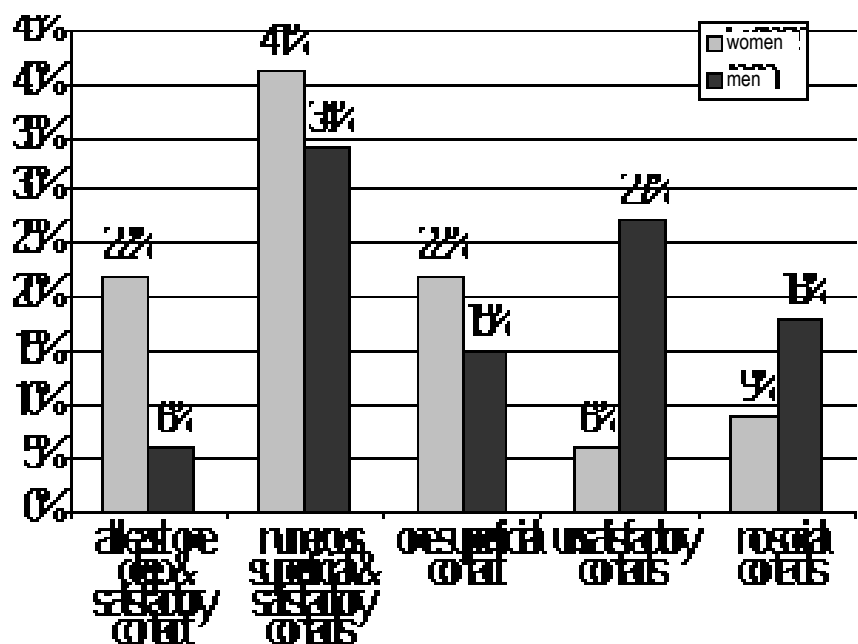


Figure 3b Comparison of gender differences in social contacts, clinical evaluation

Table 4

## Gender differences: first episode predictors

First episode predictors		Women n=40	Men n=34	p <sup>*</sup>
Age at occurrence of symptoms		27.3 (s. d. 0.7)	24.3 (s. d. 4.8)	*p=0.03
Age at 1 <sup>st</sup> hospital admission		22.1 (s. d. 0.6)	25.4 (s. d. 5.6)	n.s.
Time between onset and hospitalisation		47 weeks (s. d. 20)	61 weeks (s. d. 112)	n.s.
Onset of illness	Acute	65% (26)	67% (23)	n.s.
	Protracted	35% (14)	33% (11)	
Episode of illness	First	33% (13)	32% (11)	n.s.
	Subsequent	67% (27)	68% (23)	

\* to evaluate differences between groups, t test and  $\chi^2$  test were used

time was as long as 500 weeks (the spread with the other patients was from 1 to 344 weeks). When he was excluded from the evaluation, the above mentioned difference shrank to 2 weeks.

## First hospitalisation predictors

When we compared the degree of intensity of psychopathological symptoms measured with BPRS LA, we did not find any statistically significant differences in the evaluations performed at admission and later at discharge. This lack of differences is observable also in the domains within the BPRS LA scale: positive symptoms (points 5, 7, 8, 9, 11 of the scale), negative symptoms (points 13, 14, 17, 18, 20), and affective symptoms (points 3 and 22).

The level of formal thought disorder was identical: with both men and women in 40% of the patients the disorder was more than mildly intense. Also, the duration of the first hospitalisation did not differ in men or women. Additionally, in 37 female and 22 male patients we examined the structural pathology of the brain on the basis of computed tomography and did not establish differences in any of the eight examined regions of the brain (four cortical and four subcortical regions). A detailed discussion of the results of that research is included in our paper [18] which is still in the press. The results are shown in Table 5.

Although no statistically significant differences were observed, it is manifest that during the first hospitalisation of women a considerable reduction of psychopathological symptoms (measured with the use of BPRS LA) was obtained, namely in overall symptoms (in women the reduction reached 31 points, in men 23.5 points), in positive symptoms (women 11.3 points, men 9.6 points), and in negative symptoms (women 4 points, men 2.1 points).

## Discussion of results

Table 5

## Gender differences: first hospitalisation predictors

First hospitalisation predictors	Women n=46		Men n=34		P*
	Points	Standard deviation	Points	Standard deviation	
BPRS-total points at admission	65.6	15.3	61.2	12.2	n.s.
BPRS-positive symptoms at admission	18	4.8	17.4	5.2	n.s.
BPRS-negative symptoms at admission	12.5	6.9	12	4.3	n.s.
Affective symptoms at admission	4.3	1.9	3.8	1.6	n.s.
BPRS-total points at discharge	34.5	6.2	37.5	7.8	n.s.
BPRS-positive symptoms at discharge	6.7	2.1	7.8	2.9	n.s.
BPRS-negative symptoms at discharge	8.5	3.2	9.9	3.9	n.s.
Formal disorders of thinking	2.6	1.8	2.6	1.7	n.s.

\* to evaluate differences between groups, t test and Mann-Whitney's test were used

Similarly as Levin, Goldstein or Häfner, whom we quoted in the introduction, we observed in the group of women more favourable results as to the predictors of the course of schizophrenia. Women's advantages, as confirmed in our research, lie in the later onset of the illness, better premorbid social functioning and less common schizoid or schizotypal personality disorders.

We collected the data on the onset of the illness which can be defined either as the 'time of the occurrence of the first symptoms' or 'the time of the first hospitalisation'. The statistically significant difference confirms a later beginning of schizophrenia in women only as to the age when the first symptoms occur. Nevertheless, no difference is observed as to the age of the first psychiatric admission, although women are older, on the average, by 2.7 years. That such a difference, which approximates the results quoted by other authors (namely 3-5 years, cf. Childers and Harding [9], Häfner et al. [4, 19], Levin et al. [15] or Loranger [7]) does not attain a statistically significant level may be explained on the basis of the methodological assumption of the research: it excluded those patients who were first psychiatrically hospitalised before they were 18 years old. The most similar results are quoted by Childers and Harding [9], in whose research (conducted with a group of almost the same size and including only five patients who were first admitted before age 18, and based on the same diagnostic criteria) the age when the first symptoms occurred and gender differences in this area are practically identical as in our study group, but the authors do not mention any differences as to the age of first psychiatric admission. Moreover, in our study there appears no statistically significant difference when we compare the time between the onset of the illness and the first hospitalisation, although in women it was shorter by 14 weeks. This, however, was caused by the fact that the group included a male patient for whom the time between the onset of the illness and his first hospital admission was

considerably longer than in the majority of other cases.

Social functioning, when evaluated clinically acc. to DSM III, dimension V, shows a statistically significant difference: predominantly, it is women who function socially well. Also, the predominance of women is observed as statistically significant or at least it is perceptible as a trend as to the majority of those parameters that are taken into consideration in the evaluation of social functioning. The level of statistical significance appeared only in the area of premorbid social contacts, while the level of unvaried tendency was achieved in some demographic data such as marital status, stable relationship, education, living outside the family home. Only in the area of professional activity or continuity of education were there no gender differences. The higher level of women's premorbid social functioning corresponds with the results obtained by other researchers, among others Chiders and Harding [9], Häfner et al. [4], Levin et al. [1], Loranger [7]. The lack of statistical significance in the above mentioned demographic data, just in the case of the age of the first admission, may be related to the quoted methodological assumption, which was to include in the study group patients aged over 18. This assumption could influence the balanced ages at the first admission and thus the balance of time needed to adopt new social roles.

We have not found out any differences in the evaluation of the intensity of psychopathological symptoms measured with the use of BPRS LA. This refers both to the overall evaluation, positive, negative and affective symptoms. Men and women did not differ as to the occurrence of catatonic, hebephrenic and formal thought disorders. This lack of differences stands in contrast to the results obtained by Levine [1] and Goldstein and Link [20], who observed a statistically significant predominance of negative symptoms in men and affective symptoms in women. The aforementioned absence of differences corresponds, on the other hand, with the results presented in the papers of such authors as Addington et al. [12] or Häfner et al. [4]. The reduction of the psychopathology level was clearer in women, but the result was not statistically significant. The lack of statistical significance of the difference that appears in papers by other researchers and that had been associated with men's poor response to treatment can be explained by the special character of the ward where the research was carried out. The ward focuses on the treatment of patients after the first episode of schizophrenia through a variety of therapeutic activities (as described by the ward's staff in the article published by *Psychiatria Polska* [21]), which can account for the level of compliance observed in men and women.

### Conclusions

- 1) Schizophrenic female patients, as compared to male patients, are characterised by better premorbid social functioning.
- 2) Schizophrenic men manifest schizoid or schizotypal personality disorders more often than women.
- 3) The first symptoms of schizophrenia occur in women later than in men.
- 4) At their first admission, men and women do not differ as to the intensity of psy-

chopathological symptoms, including negative, positive and affective symptoms.

### References

1. Levine RRJ. *Sex differences in schizophrenia: timing or subtype?* Psychological Bulletin. 1981; 90: 432-44.
2. Goldstein JM, Tsuang MT. *Gender and schizophrenia: an introduction and synthesis of findings.* Schizophrenia Bulletin. 1990; 16: 179-83.
3. Angermeyer MC, Kühn L, Goldstein JM. *Gender and the course of schizophrenia: differences in treated outcome.* Schizophrenia Bulletin. 1990; 16: 293-307.
4. Häfner H et al. *Causes and consequences of the gender difference in age at onset of schizophrenia.* Schizophrenia Bulletin. 1998; 24: 99-113.
5. Cechnicki A. *Analiza wpływu wybranych czynników na wyniki leczenia w obszarze społecznym. Krakowskie prospektywne badania schizofrenii.* Badania nad schizofrenią. Lublin, 1998, I.
6. Seeman MV, Lang M. *The role of estrogens in schizophrenia gender differences.* Schizophrenia Bulletin. 1990; 16: 185-94.
7. Loranger AW. *Sex differences in age of onset of schizophrenia.* Archives of General Psychiatry. 1984; 41: 157-61.
8. Albus M, Maier W. *Lack of gender differences in age at onset in familial schizophrenia.* Schizophrenia Bulletin. 1990; 18: 51-7.
9. Childers SE, Harding CM. *Gender, premorbid social functioning and long-term outcome in DSM III schizophrenia.* Schizophrenia Bulletin. 1990; 16: 309-18.
10. Flor-Henry P. *Influence of gender in schizophrenia as related to other psychopathological syndromes.* Schizophrenia Bulletin. 1990; 16: 211-27.
11. Gur RE, Petty RG, Turetsky BI, Gur RC. *Schizophrenia throughout life: sex differences in severity and profile of symptoms.* Schizophrenia Research. 1996; 21: 1-12.
12. Addington D, Addington J, Patten S. *Gender and affect in schizophrenia.* Canadian Journal of Psychiatry. 1996; 41: 265-8.
13. Płocka M, Rybakowski J. *Odrębności schizofrenii u mężczyzn i u kobiet.* Psychiatria Polska. 1992; 24: 337-45.
14. Sellwood W, Tanier N. *Demographic factors associated with extreme non-compliance in schizophrenia.* Soc. psychiatry Epidemiol. 1994; 29: 172-7.
15. Levine RRJ, Gully LR, Risch SC, Jewart R, Houpt JL. *Sexual dimorphism, brain morphology and schizophrenia.* Schizophrenia Bulletin. 1990; 16: 195-205.
16. Cechnicki A. *Prospektywne badania przebiegu schizofrenii - nawrót i rehospitalizacja jako kryterium wyników leczenia.* Postępy Psychiatrii i Neurologii. 1997; 6, suplement 2(5): 7-15.
17. Roztworowska M. *Zależność przebiegu schizofrenii od klimatu emocjonalnego rodziny mierzonego wskaźnikami Ujawnianych Uczuć.* Typescript of doctoral thesis. Kraków 1991.
18. Walczewski K, Cechnicki A, Kleinrok K. *Zależności między zmianami morfologii mózgu a dynamiką obrazu psychopatologicznego u chorych na schizofrenię.* in press.
19. Häfner H et al. *When and how does schizophrenia produce social deficits?* European Archives of Psychiatry and Neurological Sciences. 1995; 246: 17-28.
20. Goldstein JM, Link BG. *Gender and the expression of schizophrenia.* Journal Psychiatry Research. 1988; 22: 141-55.
21. Roztworowska M, Opoczyńska M, Ćwikliński Z. *Proces diagnostyczno-terapeutyczny u pacjentów z pierwszym epizodem psychiatrycznym w warunkach oddziału stacjonarnego.* Psychiatria Polska. 1997; 31: 5-20.
22. Maier W et al. *The impact of gender and age at onset on the familial aggregation of schizophrenia.* European Archives of Psychiatry and Neurological Sciences. 1993; 242: 275-85.
23. Tamminga CA. *Gender and schizophrenia.* Journal of Clinical Psychiatry. 1997; 58: 33-7.

Author's address:

Adult Psychiatry Clinic  
Collegium Medicum Jagiellonian University  
pl. Sikorskiego 2/8  
31-115 Kraków  
Poland