Heredity in Catatonic Schizophrenia

N. Mimica, V. Follnegović-Šmalc and Z. Follnegović

ABSTRACT

The study presents data about heredity of catatonic schizophrenia in comparison with all other types of schizophrenia. The sample consisted of 402 schizophrenics, who were followed up from 1972 until 1990/91. It was found that ICD diagnosis of catatonic type of schizophrenia was made in 59 (14.7%) cases, once or several times. Among these patients there were 28 males and 31 females. These 59 patients with noted catatonic symptoms, at least once in their life, were compared with the remaining 343 patients, who never had catatonic symptoms. In 44.1% of catatonics positive psychiatric heredity was found and that was significantly greater (p<0.001) than in other schizophrenics (20.1%). This study confirms a great significance of genetic predisposition for developing schizophrenia, and it supports the thesis that the catatonic type is relatively mostly genetically determined.

Introduction

Significance of heredity in etiology of the so-called functional mental disorders has been supposed for a long time, because of apparent family aggregation. Schizophrenia is one of the most important mental functional disorders. At the present time, functional mental disorders are not characterized by any specific biochemical-laboratory, or morphological markers. Schizophrenia is mainly a chronic disorder which in majority of the cases takes an episodic course. In the acute psychotic episode, the disease is characterized by thought intrusion, thought broadcast, thought withdrawal, delusions of control, voices discussing the patient or commenting on his thoughts or actions.

In most cases, these so-called positive symptoms are accompanied by negative symptoms, characterized by functional deficits such as affective flattening, avolition and anhedonia. The essential feature of catatonic type of schizophrenia is marked psychomotor disturbance, which may involve stupor, negativism, rigidity, excitement, or posturing.

The observations about familial aggregation of particular disease are intriguing but they don’t give a definitive answer as to whether there exists a predominance of genetic factors or some exogenous factors of environment within the family. For this reason family, twin and adoption studies, as well as modern techniques of molecular genetics, are being used today.

Received for publication May 17, 1996.
The risk of schizophrenia developing is greater in members of a schizophrenic patient's family than in the general population in which the risk is 0.86%. The closer the relationship, i.e., the greater the number of shared genes, the higher the risk. For instance, if both parents are schizophrenics the risk is 46.3%, while if one of uncles/aunts/nephews/nieces is schizophrenic the risk is 2.8%.

Taking a weighted average from all of the schizophrenia twin studies proband-wise concordance in monozygotic twins is 46% compared with 14% in dizygotic twins.

All adoption studies have shown that risk of the disease is increased only among genetic relatives of a schizophrenic; simply living with a schizophrenic does not affect the risk.

Recently there have been studies that tried to find on which chromosome the specific gene for developing schizophrenia is located. For example, Sherrington et al. claim that locus for schizophrenia is on chromosome 5. But in another study lack of linkage to chromosome 5q11–q13 markers in six schizophrenia pedigrees was found. Thus, no consistent linkage has yet been found for schizophrenia.

In the sample of 402 schizophrenics there were 59 patients (28 males and 31 females), who were diagnosed at least once in their life as catatonic schizophrenics (V/295.2) according to valid ICD classification. The comparative group included the remaining 343 schizophrenic patients, in whom the episode of catatonic schizophrenia was never noted in their life during a follow-up. The majority of patients in the comparative group had a paranoid type of schizophrenia.

Using Register all 402 patients were followed up until 1990/91. In order to obtain data on the diagnosis of catatonic schizophrenia every hospitalization and diagnosis at discharge was noted.

Heredity was considered as positive if any first, second or third-degree relative of a schizophrenic was hospitalized due to psychotic disorder, or had committed suicide. Data were obtained in a field study, including anamnestic and heteroanamnestic data, and were checked by CPCR and Croatian Suicides Register (CSR). Contradictory heredity data were considered as «unknown heredity».

Statistical differences among the groups were tested by Chi-square test.

Subjects and methods

As a base for forming this sample of schizophrenics, the Croatian Psychotics Case Register (CPCR), which has been run in Croatian National Institute of Public Health since 1962, was used. The Register was formed on the basis of obligatory reports of hospitalized psychotic patients. Representative sample of schizophrenics, for epidemiological-clinical follow-up, was formed in 1972 from the evidence of 8,068 patients younger than 55 years, and without additional diagnosis of mental retardation. This analyzed sample comprised 402 patients (207 males and 195 females).

Results

It has been shown that in this sample, which we consider that it is representative for Croatia, there were 59 (14.7%) schizophrenics with one or more episodes of catatonic schizophrenia. Although patients have at some stage presented, in other hospitalizations and examinations, some other schizophrenic pictures, this group was called «catatonic schizophrenics», and the compared group they were compared with was called «other schizophrenics».

It was found that there were no significant differences in the frequency of catatonic schizophrenic episode among males and females.
Table 1 shows that in the group of catatonic schizophrenics positive psychiatric heredity was noted in 44.1% of cases, which is significantly more than in the group of other schizophrenics (20.1%). The comparative group consisted mostly of paranoid schizophrenics.

**TABLE 1**

**HEREDITY IN SCHIZOPHRENIA**

<table>
<thead>
<tr>
<th></th>
<th>Catatonic schizophrenics</th>
<th>Other schizophrenics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heredity</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Positive</td>
<td>26</td>
<td>44.1**</td>
</tr>
<tr>
<td>Negative</td>
<td>20</td>
<td>33.9*</td>
</tr>
<tr>
<td>Unknown</td>
<td>13</td>
<td>22.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>59</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Chi-square test: *p<0.01; **p<0.001

**Discussion**

Some authors have published results relating to the research of heredity in different types of schizophrenia. Thus, Scharfetter and Nussperi;\(^{12}\) have published results of family genetic study. When schizophrenic probands were further divided by subtype diagnosis, the highest rate of global schizophrenia was found in relatives of catatonics (13%), hebephrenics (8%), and paranoid schizophrenics (7%). In another family heredity study Scharfetter;\(^{13}\) has concluded that there was a tendency toward differences in the global morbidity risk of schizophrenia, followed by the relatives of hebephrenics and by the relatives of paranoiae. He also found a tendency toward a predominance of homotypical secondary cases among first-degree relatives. However, these results were not statistically significant, so they cannot be used as arguments for genetic separation of schizophrenic subtypes.

Jhingan & Munjal from India examined dermatoglyphics in a small sample of female and male catatonic schizophrenics in comparison with normal female and male controls;\(^{14,15}\). It was found that there were significant differences in the qualitative and quantitative features of finger and palm prints in catatonic schizophrenics of both sexes in comparison with the control group.

On the basis of recent genetic research, majority of authors claim that polygenic inheritance is involved in the developing of schizophrenia. Problem is a complex one, since, of the 100 000 genes estimated to exist in man, about 30% are being expressed in the brain;\(^{8}\)

As it is in majority of other diseases, schizophrenia is probably due to, more or less, both endogenous-genetic and exogenous-environmental factors. In relation with the exogenous factors a lot of attention was paid to psychosocial factors as a cause of schizophrenia. However, the studies of adoption, as well as the studies of twins, MZ and DZ, do not speak in favor that these factors have essential influence on the occurrence of schizophrenia. The well-known winter birth effect in non-mendelian "constitutional" diseases, such as schizophrenia, may be due to seasonal pre-ovulatory overripeness ovopathy (SPoO);\(^{16}\). There are also some hypotheses that prenatal exposure to the A2 influenza epidemic may provoke occurrence of schizophrenia in genetically predisposed persons, but in the Republic of Croatia this was not confirmed;\(^{17}\). Some other viral theories of schizophrenia have also been put forward recently;\(^{18,19}\) as well as the theory of integrated viral genes as potential pathogenesis in the functional psychoses;\(^{20}\), but there is not enough research to support this.

In conclusion it is stressed that, at present, real causes and pathogenesis of developing schizophrenia are not known. However, our research confirms great significance of genetic predisposition for the development of schizophrenia, and it seems that the catatonic type of schizophrenia is the one which is relatively mostly genetically determined.
REFERENCES


N. Mimica

Psychiatric Hospital Vrapče, University Department of Psychiatry
Bolnička cesta 32, 10090 Zagreb, Croatia

HEREDITET U KATATONOJ SHIZOFRENIJI

SAŽETAK

Ovo istraživanje iznosi podatke o hereditetu katatnih shizofreničara u komparaciji s ostalim shizofreničarima. Reprzentativni uzorak brojio je 402 bolesnika i to 207 muškaraca i 195 žena. Putem Registra psihotika svih 402 bolesnika traženo je od 1972. do 1990/91. godine. U uzorku je bilo 59 (14,7%) shizofreničara (28 muškaraca i 31 žena) koji su makar u jednom navratu bili dijagnosticirani kao katatoni shizofreničari (V/295,2), a prema važećoj MKB klasifikaciji. Komparacijsku skupinu činila su preostala 343 shizofreničara u kojih nije nikada u njihovom životu tijekom praćenja zabilježena epizoda katatone shizofrenije. U 44,1% katatničara zabilježen je pozitivan psihiatrijski hereditet, a što je bilo značajno više (p<0,001) nego kod skupine ostalih shizofreničara (20,1%). Ova studija potvrđuje veliko značenje genetske predispozicije za nastanak shizofrenije, a pri tomu se naglašava da je katatoni tip relativno najviše genetski determiniran.