

Short communication

Obstetric complications in siblings of Japanese schizophrenics: Data from the Maternal and Child Health Handbook

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Abstract

Although the precise etiology of schizophrenia remains unknown, the development of schizophrenia has been associated with a history of obstetric complication (OC). Furthermore, some studies show structural and functional brain abnormalities in the unaffected siblings of schizophrenics. In this study the perinatal histories of 18 unaffected siblings of schizophrenics and 15 unrelated healthy controls, as detailed in their mothers' Maternal and Child Health Handbook records, were retrospectively analyzed. Records were scored for obstetric complication by the method developed by Parnas et al. (1982) [Parnas, J., Schulsinger, F., Teasdale, T.W., Shulsinger, H., Feldman, P.M., Mednick, S.A., 1982. Perinatal complications and clinical outcome within the schizophrenia spectrum. *Br. J. Psychiatry* 140, 416–420]. The authors found the sibling group had greater pregnancy and birth complication (PBC) frequency, severity and total scores than the control population.

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1. Introduction

Several studies have indicated that siblings of schizophrenics who do not develop schizophrenia nevertheless have higher rates of other psychiatric disease. Structural and functional brain abnormalities found in probands with schizophrenia have been reported to be expressed to some degree in their relatives without schizophrenia. Unaffected siblings of schizophrenics show significant reduction in cortical gray matter volume and significant increases in sulcal cerebrospinal fluid (CSF) volume compared to controls (Cannon et al., 1998). Temporal lobe volume has been shown to be significantly decreased by approximately 10% in the siblings of early-onset schizophrenics, compared

to normal controls (Dauphinais et al., 1990). Gogtay et al. (2003) reported that unaffected siblings of patients with childhood-onset schizophrenia had smaller total cerebral volume and total, frontal, and parietal gray matter volumes. Unaffected siblings of probands with schizophrenia show neuropsychological deficits intermediate between those of schizophrenic patients and normal controls (Wood and Cook, 1979; Maier et al., 1992; Cannon et al., 1994; MacDonald et al., 2003). These neuropsychological deficits involve verbal memory, abstraction, attention and language functions.

There have been many studies suggesting that obstetric complications (OCs) are associated with later development of schizophrenia (Geddes and Lawrie, 1995; McNeil et al., 2000). OCs, then, may constitute an early environmental factor that induces subsequent development of schizophrenia (McNeil, 1995). It is also possible that a given obstetric risk factor reflects a genetic liability for the disorder, since genetic factors are known to play a substantial role in schizophrenia (Rosso et al., 2000). If such genotype–environment covariation exists, one would expect a higher rate of OC in the siblings of schizophrenics than in the general population.

Abbreviations: CSF, cerebrospinal fluid; MCHH, Maternal and Child Health Handbook; OC, obstetric complication; PBC, pregnancy and birth complication.

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Since 1948, every pregnant woman in Japan has been issued a 'Maternal and Child Health Handbook' (MCHH) in order to facilitate the monitoring of her pregnancy and to provide education regarding maternal self-care. The treating obstetrician records pregnancy and delivery data in the MCHH. Many mothers keep these handbooks even after their children have grown up.

The purpose of this study was to examine the perinatal histories of unaffected siblings of schizophrenics for obstetric complication risk factors, using the MCHH as the data source.

2. Methods

2.1. Subjects

Eighteen schizophrenic patients were identified at the National Minami Hanamaki Hospital during the period from April 2000 to September 2002, and the obstetric records (MCHH) of their consenting siblings (10 male; 8 female) obtained. The National Minami Hanamaki Hospital is located in Hanamaki city, Iwate prefecture, about 300 km north from Tokyo. The diagnosis of schizophrenia was made by one of the authors (KO) according to the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV; American Psychiatric Association, 1994), based on non-structured clinical interviews and all available medical data. The siblings were also interviewed and diagnosed by KO as not meeting criteria for mental illness as defined by the DSM-IV. Siblings were born between 1968 and 1975. When the MCHH of more than one sibling was available, the sibling closest in age to, and the same gender as the patient was selected.

Fifteen unrelated healthy volunteers (10 male and 5 female) born between 1968 and 1975 were recruited from hospital staff, medical students and their associates, and their MMCH's subsequently obtained. All members of the control group had good social functioning and no history of psychiatric disorders. All subjects were Japanese who provided written informed consent following explanation of the purpose and significance of the study.

2.2. Assessment of perinatal complications

Parnas et al. (1982) developed a scale to assess obstetric data recorded at the time of delivery. The original scale

allocates a weighted score between 1 and 4 for each specific pregnancy and birth complication (PBC), as well as three global scores assessing PBC frequency (the number of distinct PBCs), PBC severity (the highest individual weighted score) and total score (the sum of the weighted scores).

The MCHH revised in 1966 is a 15-item document, which is described by Kunugi et al. (1996). Two modifications in the Parnas rating method were made in the application of the scale to MCHH data, as suggested by Kunugi et al. (1996): (1) inertia uteri was given a weighted score of 2, because it was not known in all cases whether inertia uteri was primary or secondary; (2) only 500 ml or more of blood loss during delivery (or blood loss described as a 'large amount') was rated, with a weighted score of 2 assigned. The MCHH global scores and were blindly tabulated by one of the authors (KO). The rating, or weighted scoring of individual PBCs, was also done blindly by KO.

2.3. Statistical analysis

The frequency, severity, and total PBC scores of the siblings and controls were compared using the Mann-Whitney *U*-test. All reported *p*-values are two-tailed.

3. Results

Six siblings of the schizophrenics and 3 controls had OCs. The scores of the siblings of schizophrenics and the controls are shown in Table 1. Table 2 shows the numbers of the OCs in siblings and controls. The sibling population showed higher PBC frequency scores, severity scores and total scores than the control group.

4. Discussion

The authors studied the OCs of 18 siblings of schizophrenics and 15 controls based on MCHH data. The siblings tended to have had greater frequency and severity of OCs than did controls. To our knowledge, this is the first paper focusing on OCs in siblings of schizophrenics.

Our conclusions may be limited by several factors. All subjects were recruited from one hospital, and the

Table 1
Comparison of PBCs in siblings with schizophrenics and controls using the Parnas scale

	Number score		Severity score		Total score	
	Mean (S.D.)	Significance	Mean (S.D.)	Significance	Mean (S.D.)	Significance
Siblings	0.56 (1.0)	$Z=-1.9$	0.56 (0.86)	$Z=-1.9$	0.83 (1.6)	$Z=-1.9$
Controls	0.07 (0.26)	$p=0.06$	0.07 (0.26)	$p=0.05$	0.07 (0.26)	$p=0.05$

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