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Sex Differences in Schizophrenia: A Demographic, Symptomatic, Life History and Genetic Study

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Abstract: Twenty-one male and 32 female inpatients who met the criteria of schizophrenia according to the Research Diagnostic Criteria were compared for demographic, symptomatic, life history, and genetic variables. Female schizophrenics were marginally less likely to have auditory hallucinations; They were more likely to have early loss experiences (either bereavement or separation from a parent) before the age of 16. No other differences were found between the men and women.

Key Words: *schizophrenia, sex difference, demography, symptom, early loss, genetics*

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INTRODUCTION

There has been ample evidence to suggest that the causes of schizophrenia are multiple and interacting, almost certainly involving both genetic and environmental factors. Among many potential factors, sex difference is one which has recently attracted the attention of a number of psychiatric investigators.[19] Male schizophrenics have been reported to have an earlier age of onset[10], poorer premorbid history[7 10 14], lower premorbid IQ[2], lower family morbidity of the illness[9 30], poorer response to neuroleptic treatment[25], and poorer outcome[24 25]. Female schizophrenics are more likely to manifest affective symptoms, while male schizophrenics show more withdrawal symptoms.[3 4 8 20]

It seems, however, that less attention has so far been paid to some aspects of sex differences in schizophrenia, such as other symptoms and early loss experiences. Furthermore, most of the literature on this topic refers to schizophrenics in Western countries; to the best of our knowledge, no study has been carried out on sex differences among subjects in Japan. This report is a preliminary one to investigate the issue among schizophrenic inpatients in Japan.

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METHODS

A total of 53 patients was selected from among those consecutively admitted between 1984 and 1987 to one of the seven inpatient units collaborating in a multicenter diagnostic project on major psychiatric disorders.[5] They all fulfilled the definite or probable criteria for schizophrenia according to the Research Diagnostic Criteria (RDC).[26] Patients with epilepsy, mental retardation, or any organic brain lesion as well as those aged 65 or more were excluded. Informed consent was given by every patient prior to interview.

A semi-structured *ad hoc* interview (the interview guide is available on request to the senior author) was conducted to establish the RDC diagnosis and collect demographic and life-history information.

Current symptoms were assessed using the Brief Psychiatric Rating Scale (BPRS)[22] revised by Kolakowska[18], Hamilton's Rating Scale for Depression (HRSD)[11], the Scale for the Assessment of Negative Symptoms (SANS)[1], and the Global Assessment Scale (GAS)[27]. The revised BPRS has 18 items, each of which is rated between 0 and 6 with a maximum total score of 108. From a factor analytic study of the scale[15], four subscales were extracted: positive, negative, dysphoric, and manic symptom scores. Each of the four subscales consisted of four items, with a score range of 0 to 24. For the assessment of depressive symptoms, we used the 21-item version of the HRSD. The SANS assesses five negative symptoms : affective flattening, alogia, avolition-apathy, anhedonia-asociality, and attention disturbance. The GAS measures the global functioning of psychiatric patients for three different time-periods: average functioning prior to the present episode, that during the worst week of the episode, and that during the last week. The GAS scores can range between 1 and 100. A higher score on all scales and subscales except the GAS indicates a more severe pathological condition. Symptoms used in the criteria of RDC schizophrenia, major depressive disorder, and mania were also rated, using an *ad hoc* check list.

Life-history information that was sought was of any of bereavement or any separation lasting 12 months or more from either parent, before the age of 16.

Information on psychiatric disorders among the patients' first-degree relatives was collected using the Family Study-Research Diagnostic Criteria (FH-RDC)[6]; the informants were usually the patients themselves. The interview psychiatrists, 12 in all, had participated in a reliability study of RDC and FH-RDC diagnosis, in both case vignette and test-retest designs.[13 16 29]

All the demographic, symptomatic, life-history, and genetic variables were compared between the male and female patients, using χ^2 test or two-tailed t test as appropriate.[28]

RESULTS

Of the schizophrenic inpatients studied, 21 were males and 32 females. For the present episode, 46 (87%) met the definite criteria of RDC schizophrenia, and 7 (13%) the probable criteria. Fourteen (26%) had a past episode of schizophrenia.

Demographic Variables

The mean age was 28.7 (S.D. 8.1) for the whole sample; the male subjects (mean 27.9, S.D. 8.1) did not differ from the females (29.2, S.D. 8.3) ($t=0.56$, $P=0.579$) in this respect. Nor did they differ in terms of college education or marital status (Table 1).

Table 1: Demographic Variables of Schizophrenic Inpatients by Sex

Demographic Variables	Male	Female	χ^2	p
Education				
college education	4 (19)	10 (31)	0.445	0.5047
Marriage				
never married	18 (86)	11 (79)	1.700	0.1922
N	21	32		

% in parentheses.

Symptomatic Variables

No significant difference was observed between the male and female subjects, respectively, in the mean duration of the present episode or mean age of onset of schizophrenia. Nor did any of the total scores and subscale scores of the BPRS, HRSD, SANS, or GAS demonstrate a significant difference between the two sexes (Table 2).

Of the symptoms listed in the diagnostic criteria of schizophrenia, major depressive

Table 2: Symptom Ratings in Schizophrenic Patients by Sex

Rating Scales	Sex		t	P
	Male	Female		
Duration of present episode (week)	169.0 (184.1)	151.0 (178.6)	0.35	0.728
Age of onset (yr)	21.7 (5.9)	23.6 (7.3)	0.97	0.335
BPRS				
total score	25.3 (9.0)	21.9 (10.4)	1.22	0.229
positive symptom score	10.9 (4.3)	9.3 (6.0)	0.99	0.326
negative symptom score	6.8 (3.8)	5.8 (4.2)	0.87	0.389
dysphoric symptom score	4.5 (3.8)	4.1 (2.8)	0.51	0.613
manic symptom score	0.7 (1.4)	0.8 (1.6)	0.27	0.786
HRSD				
total score	14.8 (7.6)	13.8 (6.5)	0.53	0.601
SANS				
total score	59.0 (28.7)	57.3 (29.7)	0.21	0.838
affective flattening	17.1 (10.2)	15.3 (11.3)	0.59	0.556
alogia	7.8 (6.1)	7.9 (6.4)	0.07	0.943
avolition-apathy	12.6 (5.6)	11.5 (5.0)	0.75	0.458
anhedonia-asociality	14.4 (7.9)	13.8 (6.5)	0.33	0.745
attention disturbance	7.1 (4.5)	8.8 (5.3)	1.24	0.222
GAS				
prior to the episode	60.3 (15.4)	64.3 (15.5)	0.91	0.368
worst week	26.3 (5.8)	23.4 (8.6)	1.35	0.183
past week	31.0 (7.6)	33.6 (12.3)	0.92	0.364

Table 3: Life-History Features of Subjects by Sex

Loss Experience	Sex		χ^2	P
	Male (N=21)	Female (N=32)		
Paternal separation	0 (0)	2 (6.3)	0.186	0.6665
Paternal bereavement	0 (0)	3 (9.4)	0.700	0.4026
Any loss from father	0 (0)	5 (15.6)	2.025	0.1547
Maternal separation	0 (0)	3 (9.4)	0.700	0.4026
Maternal bereavement	0 (0)	4 (12.5)	1.330	0.2487
Any loss from mother	0 (0)	7 (21.9)	3.557	0.0593
Parental separation	0 (0)	5 (15.6)	2.025	0.1547
Parental bereavement	0 (0)	7 (21.9)	3.557	0.0593
Any loss from either parent	0 (0)	10 (31.3)	6.176	0.0129

% in parentheses.

disorder and mania, only "voices talking to each other" or "voices giving a running commentary" had a marginal excess among the males as against the females (62% vs. 31%, df=1, $\chi^2=3.68$, $P=0.0550$).

Life History

While no male patients experienced loss of either parent as a child, 31% of the female patients experienced at least one type of early loss; this reached a statistical significance for any loss of either parent (Table 3).

Genetic Variables

Details of the family histories of the present probands have been reported elsewhere[17]: 5 (9.4%) had at least one first-degree relative with FH-RDC schizophrenia. The proportion of probands with a positive family history of schizophrenia was almost identical for male (2/21=0.095) and female (3/32=0.094) patients.

DISCUSSION

Though this study was limited by the small number of subjects, it included consecutive cases and a semi-structured format of interviewing was used to elicit symptoms and other necessary clinical information. The patients were relatively young and well educated (about a quarter of them had entered college), so that information given by them may be more reliable than in the case of older subjects. Unlike other studies, we did not find sex differences in the age of onset, premorbid history (education, marriage, and premorbid GAS score) or family history of schizophrenia. However, because of the small number of patients, there should be great caution in extrapolating these findings to schizophrenics in general.

Symptomatic differences between male and female schizophrenics have been a primary focus of only few research studies. Our measurement of symptoms was comprehensive, because it covered not only psychotic and diagnosis-specific symptoms but also non-psychotic and nonspecific ones, using three different rating scales. However, none of the items on the three scales showed a significant sex difference. A marginal difference was observed only in respect of "voices talking to each other"—a Schneiderien first-rank symptom, which was more frequent among the male patients. This finding may warrant a replication study, because previous investigators who studied symptomatic differences between the two sexes examined syndromes rather than symptoms.

Of interest is the finding that none of the male patients experienced early parental loss, whereas a substantial proportion of the female patients did so. Though statistical significance was reached only for "any type of parental loss," possibly because of the small number in the sample, specific types of loss also showed lower, yet still substantial rates. This finding is not easy to explain. The experience of early parental loss has long been identified as a predisposing vulnerability factor, though mainly for affective disorders. Our finding may suggest that female schizophrenics differ from male schizophrenics in being more vulnerable to early environmental stresses as reflected in parental loss. This also may be an issue that deserves replication.

A recent study has demonstrated that sex differences in the family risk for schizophrenia are more prominent for schizophrenic probands whose age of onset is greater than 17, compared with those whose onset occurred at a younger age.[23] Unfortunately, data on the age of onset of schizophrenia among relatives were not collected in our study. Replication studies with this in mind might help clarify the relationship between family risk and sex difference in schizophrenia.

Recent epidemiological studies have suggested that the incidence of schizophrenia may have declined[21] and that the male-female ratio in the incidence has increased[12]. This suggests a need for new sex difference studies, using contemporary schizophrenic patients.

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