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Analysis of the Relationship Between Schizophrenia and the Birth Order of Children

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Abstract: This study aims at investigating the relationship between the birth order and schizophrenia. The research is conducted based on case studies carried out in Roozbeh Hospital of Tehran. Among the patients bedridden in this hospital during 2003-2004, 200 schizophrenics were selected through random sampling. This research was conducted in a field work fashion using information recording file which was based on the available documents. Results suggested that the distribution of schizophrenia among the children of a family differs in terms of their birth order. The risk of schizophrenia is relatively greater in case of either the first male or the last female children. Overall, it can be claimed that there is a significant relationship between birth order and schizophrenia. The results also showed that among the studied sample, none belonged to single-child families. Besides, the number of first-and last-child schizophrenia was equally the highest among the subjects of the research.

Key words: Schizophrenia, birth order, first male born, last female born

INTRODUCTION

No psychological disorder is more complex and stranger than schizophrenia. There have been some hypotheses proposed to explain the very nature of this disease, yet full account of this disorder has still remained ambiguous. Schizophrenia is not a single disturbance, but a blend of many psychological disorders. It is claimed that about one percent of the whole population of the world suffers from schizophrenia (Kaplan and Sadock, 2003). Among several factors thoughts to be determinates of or involved in the development of schizophrenia, family environment, life experiences and personality are given relatively due consideration. Since the birth has an important role in upbringing the children and shaping personalities (Alfred, 1982; Ernst and Angst, 1983; Bohmer and Sitton, 1993; Claxton, 1994; Freese *et al.*, 1999), it has been investigated for many decades as a factor associated with mental outcomes especially schizophrenia (Elliott, 1992).

Results of previous studies (mainly from the 1960s) have been inconsistent (Hare and Price, 1970). Previously, Böök and Rayner (1953), Wahl (1956), Goodman (1957), Gregory (1959) and Tsuang (1966) failed to point out an association between birth order and risk of developing schizophrenia (Kempainen *et al.*, 2001) but later research has generally supported such an association (Farina *et al.*, 1963; Schooler, 1964; Barry, 1967; Granville-Grossman, 1966; Sham *et al.*, 1993; Stompe *et al.*, 2000; Bender *et al.*, 2000). In this context, Kempainen *et al.* (2001) studied the relationship between

birth order and schizophrenia in the Northern Finland. The findings showed that the risk for schizophrenia raised high among male first-borns and female last-borns. The risk was lower than expected among male last-borns and females belonging to other status. These results suggest that specific birth order status is an independent risk factor for schizophrenia. McDonald *et al.* (2001) also studied the relationship between birth order and schizophrenia using logistic regression analysis. The findings of the research showed that schizophrenia is associated with urban birth and with later birth order. Haukka *et al.* (2004) studied birth order to determine risk factors for schizophrenia using case-sibling design method. The findings showed that a sibling who was less than five years older or being the first born (vs. second born) was at high risk, but siblings who were more than ten years older were at lower risk. Gaughran *et al.* (2007) tested the hypothesis that, in multiply affected families, later born children would exhibit a more severe form of schizophrenia than their older siblings. The effect of birth order on severity of illness in schizophrenia was assessed in 150 sibling pairs with schizophrenia and schizoaffective disorder.

However, different results across countries with different cultures possibly indicate that birth order is a culture-bound issue and since there have been very few studies on the relationship between birth order and schizophrenia in Iran, this study could be served as a means of comparing and contrasting similar studies conducted in Iran and other countries.

Among the very few research, is the work of the Ahmad (1994), the effect of birth order and family dimension on schizophrenia. In his research, he investigated 664 male and female schizophrenics of Roozbeh Hospital. The frequency distribution of the birth order of schizophrenic families showed that most patients were the first children and few of them were the last children. The second children had the highest number of patients and those one to the last had the lowest. Another study was conducted by Behrokh (1988) on 990 male and female patients bedridden in psychiatric sections of Shahid Lavasani Hospital. The results revealed that the distribution of patients in different orders and according to age and sex in 15-54 age-group yielded a significant difference. The results revealed that schizophrenia is more widespread among the first children (whether male or female) comparing to other children. In case of male patients, the first, third and the last have the highest percentage while the fifth and sixth children have equally the least frequency. As with female patients, the first, third and the last children have the highest frequency while the fifth and the sixth have equally the lowest. The distribution of schizophrenia in the fourth, fifth and sixth children were less than the rest. To the best of our knowledge no such more studies have been carried out in Iran.

Therefore, since there has been very few research investigating the relationship between the birth order and the schizophrenia in Iran, the present study attempts to investigate this relationship to achieve aims; to investigate the relationship between the schizophrenia and birth order; to assess which children (with regard to birth order) are more likely to be affected by schizophrenia and to investigate the distribution of schizophrenia with respect to the sex and birth order of children.

The main research question is whether there is a relationship between the birth order and the risk of schizophrenia. To answer this question, the following hypotheses (primary and secondary) are proposed:

Hypothesis 1: The first children are more likely to be affected by schizophrenia. Hypothesis 1-1: The first male children are more likely to be affected by schizophrenia. Hypothesis 1-2: The first female children are more likely to be affected by schizophrenia.

Hypothesis 2: The last children are more likely to be affected by schizophrenia. Hypothesis 2-1: The last male children are more likely to be affected by schizophrenia. Hypothesis 2-2: The last female children are more likely to be affected by schizophrenia.

In the present study the birth order and schizophrenia are conceptually and operationally defined as follows:

Birth order is the number (rank) of the birth of the patients with regard to their mothers' number of giving birth (abortions or giving birth to dead fetus are not included in this study). Birth order is indicated by a number between 1 up to 6 and the word last.

Schizophrenia is defined according to DSM-IV-TR (APA, 2000) and the studied schizophrenics have been selected regardless of the number of their hospitalizations, type of schizophrenia and the period of their medicine application.

MATERIALS AND METHODS

Schizophrenia is the phenomenological diagnosis based on the patient's observation and description. The main characteristics of schizophrenia; decrease of overall interaction, disorders in thinking and concentration, distorted comprehension, unnatural affect, self-confusing feelings, altered volition, disordered interpersonal interactions, unnatural or altered psycho motional behavior and cognitive disorder.

Due to time limitations and the limited access to data, it was not virtually possible to cover all the schizophrenic patients of Iran in this study. Therefore, the population of the initial studies was limited to patients bedridden in Tehran's specialized hospitals. However, despite the very small number of such hospitals in Tehran and the great amount of time spent on data collection, it was not feasibly possible to handle the task. As a last resort, the population was confined to only Roozbeh Hospital. Even at this point, there were still memorable limitations that made the researcher focus on a part of the patients. Considering the size of population and the necessity of representativeness of the sample, the initial size of the sample, using Morgan's formula was 100.

Therefore, the research population, due to research limitations, is reduced to the schizophrenic patients of Roozbeh Hospital of Tehran. The studied sample size which was obtained through random selection increased to 200 (half males and half females), so that in case of inefficiency of the data regarding some of the members of the sample and removing them from the sample, the sample size remains big enough. The population and the sample are selected from the years 2003-2004, since only this period was relatively perfect and reliable. In order to collect the data, a questionnaire was devised by the researcher in which the subjects were asked to indicate their sex, birth order, age and the date of

hospitalization. This information was then checked carefully with the official documents provided by the personnel of the hospital. The collected data was imported into SPSS software. Besides, χ^2 test was used to analyze the data.

RESULTS AND DISCUSSION

As shown in Table 1 studied sample the statistics suggest that the first born children have a highest (19%) risk of schizophrenia. The risk of schizophrenia is decreased in second and later born children. But the last born children have the same (highest) risk of exposure to schizophrenia as that of the first born children. On average, 15.3% of the patients were the second, the third, or the fourth children. Only 7.5% of the subjects were the fifth or the sixth children of their families. Interestingly, none of the patients was a single child. According to the statistics, except for the first and the last children, the higher the birth order rank, the less likely to be affected by schizophrenia.

Descriptive analysis of data also showed that the number of female schizophrenics who are the first or last born children of the families are more than that of female schizophrenics who are the second to the sixth child of their families. Again, in this case, none of the studied female patients was a single child. The highest percentage (22%) of schizophrenia belongs to the last born female children and the next highest percentage of this disease (18%) was that of the first born female children. The risk of schizophrenia is decreased according to birth order among the female children (except for the last born) from 18 to 8% in relation to male patients, the analysis revealed that the risk of schizophrenia among the first and the third male children is identical (20%) and more than that of other children. The second born male children have less risk of schizophrenia than the third born male children. The risk of schizophrenia is decreased in the third and later born children.

After this descriptive evidence, we turn the arguments toward the main research question that whether there is a statistically significant relationship between the birth order and the risk of schizophrenia that can be generalized to wider populations. To this end, Chi squared test was used to test the research hypotheses which were presented in the first section to answer the research question.

Results of χ^2 tests indicate that there is a significant relationship between birth order and schizophrenia (Table 2). Since, the percentage of schizophrenia is greater among the first children, thus Hypothesis 1 holding that the first children are most likely to be affected by schizophrenia is accepted. This result is same as that of Ahmad (1994), Behrokh (1998) and Haukka *et al.* (2004). The results also show that the percentage of schizophrenia is greater in the first male children, which is supported by that of Behrokh (1998) and Kemppainen *et al.* (2000). Hence, according to the findings, Hypothesis 2 holding that the percentage of schizophrenia is greater in the last children is accepted. This result is same as that of Behrokh (1998) as well as is near that of McDonald *et al.* (2001) and Gaughran *et al.* (2007), while it is unlike that of Ahmad (1994). Also accepted is Hypothesis 2-1 that the last female children are more likely to be affected by schizophrenia. This finding is similar to that of Kemppainen *et al.* (2000). However, Hypothesis 2-2 indicating that the last male children are more likely to be affected by schizophrenia is rejected.

The total frequency of the studied bedridden schizophrenics (male and female) according to their birth order suggests that the distribution of schizophrenia among the children of a family differs in terms of their birth order. Overall, it can be claimed that there is a significant relationship between birth order and risk of schizophrenia. This finding is precisely in line with previous related studies, mainly after the 1960s, which have been reviewed in the study.

Table 1: The distribution and percentage schizophrenics according to birth order

Birth rank	1st	2nd	3rd	4th	5th	6th	Last	Single	Total
Both sex (%)	38 (19)	34 (17)	30 (15)	30 (15)	16 (8)	14 (7)	38 (19)	0 (0)	200 (100)
Female	18	14	16	12	10	8	22	0	100
Male	20	20	14	18	6	6	16	0	100

Table 2: The results of the tests of research hypotheses

Birth rank	1st	2nd	3rd	4th	5th	6th	Last	Single	χ^2	df	pv
Female	18	16	14	12	10	8	22	0	100.1	7	0.001
Male	20	14	20	18	6	6	16	0	113.6	7	0.001
Total	38	30	34	30	16	14	38	0	179.2	7	0.001

The results suggest that except for the last children who are most likely to be schizophrenic, the usual trend is that the higher the birth rank of the girls, the less likely they may be affected by schizophrenia. That is, there is a negative correlation between the likelihood of schizophrenia and the birth rank of the female children. Contrary to what has been indicated earlier, we cannot definitely claim that there is negative correlation between the birth order of children and the risk of schizophrenia in case of men. However, even in this case, the probability of being affected by schizophrenia for the single children is zero.

CONCLUSIONS

In sum, there is a significant relationship between birth order and the risk of schizophrenia. The first born children (male and female) are most likely to be affected by schizophrenia. The first born male and the last born female children are at the highest risk of schizophrenia. Except for the last children who are most likely to be schizophrenic, there is a negative correlation between the birth order of female children, so that the higher the birth order of the female children, the less likely they may be affected by schizophrenia. But the same conclusion cannot be definitely drawn for the male children.

Some extra findings have been obtained from the data analysis of the research. The following findings deserve dwelling on. None of the subjects was schizophrenic was the single child of the family. The studies devoted to the personality of single children suggest that the majority of single children are not in essence tough, have no interest in misdemeanors and are more compatible. Also, they are less stifled with financial problems and consider their parents and other grown ups as their behavioral models. Their verbal growth is rapid and they acquire their self-image and flourish very soon. Schizophrenics who were either the first or the last children have equally the highest percentage of this disease among other subjects of the study. This is because the first children are usually their parents' means of learning how to bring up their children. They are more reclusive, introvert and less confident whereas the last children are delicate and seek help of their parents and others and this establishes a sense of inferiority within them.

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