*Original Article*

# ASSOCIATION OF ORDER OF BIRTH WITH SCHIZOPHRENIA

*Moin Ahmed Ansari[1], Raza-ur-Rahman[2],*
*Aftab Ahmed Siddiqui[3], Syed Zafar Haider Zaidi[4]*

## ABSTRACT

***Objectives****:* To asses the association between Birth Order and Schizophrenia in relation to other demographic factors

***Methodology****:* A cross sectional study was done and data of twelve hundred and eight patients were evaluated and managed in the psychiatric department of Isra University Hospital, Hyderabad. Eighty two Schizophrenics were compared with the rest of the psychiatric population with reference to gender, catchment area, and family type.

***Results****:* Statistically no significant difference was found between any of the birth order for the risk of Schizophrenia. Risk of Schizophrenia appears to be minimum in first born males, and maximum in first born females, but this does not reach statistical significance. Risk apparently seems to decrease as birth order goes down among urban setting; and decrease as birth order goes up; but again this finding does not reach the level of statistical significance.

***Conclusion****:* There appears to be no association between any birth order and risk of Schizophrenia, in our studied population.

**KEY WORDS:** Birth order, Schizophrenia, Psychiatric Illnesses.

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1.   Dr. Moin Ahmed Ansari
     Assistant Professor, Faculty of Psychiatry,
     Liaquat University of Medical and Health Sciences,
     Jamshoro, Hyderabad.
2.   Dr. Raza-ur-Rahman
     Assistant Professor Psychiatry,
     Dow University of Health Sciences, Karachi
3.   Dr. Aftab Ahmed Siddiqui
     Consultant Physician,
     Sultan Qaboos University, Masqat
4.   Dr. Zafar Hyder Zaidi,
     Assistant Professor Psychiatry,
     Jinnah Post-graduarte Medical Centre, Karachi

     Correspondence:

     Dr. Moin Ahmed Ansari
     Assistant Professor, Faculty of Psychiatry,
     Liaquat University of Medical and Health Sciences,
     At Sir Cowasjee Jehangir Institute of Psychiatry Hyderabad,
     Sindh, Pakistan.
     E mail: dr_moinansari@hotmail.com

## INTRODUCTION

A large number of bio-psycho-social factors contribute to the etiology of Schizophrenia. Biological factors such as genes[1,2,3], neurotransmitters[4,5], etc have been studied in several studies. Other studies focused on social factors contributing to the disease[6,7,8], such as parental behaviors[9], early life experiences[10], and others. Since the advent of theory of family constellation proposed by Alfred Adler[11], a lot of studies have been conducted on the topic of Birth Order linking it with psychiatric disorders, such as Depression[12], Obsessive Compulsive Disorder[13], and Schizophrenia.[14]

Schizophrenia has been investigated for several years in various aspects for it's association with order of birth. K.L. Granville-Grossman[15], long time back in 1966, concluded

that; when sex is not considered as a separate variable, Schizophrenia is not associated with any particular birth order; male schizophrenics are less often first-born and more often last-born; distribution of female schizophrenics among various positions does not depart from expectation. This finding supported the study of Goodman[16] who had presented his study in 1957. But Schooler[17] concluded that last-born females are more prone to the disease. In 1974 Wild et al[18] found out increased risk of Schizophrenia among first-born males. Later findings were supported by study by Solomon[19] and his colleagues. This literature review lead the flow of thoughts to search and explore what factors would lead to this association? In the year 2000 Bender and his colleagues[20] speculated that etiological phenomena might be the biological factors or expressed emotions. In 2001 a study was designed and later on published in Acta Psychiatrica Scandinivia; by Lisa Kemppainen and colleagues[21] proving there-in that Birth order status is an independent risk factor for Schizophrenia.

With this background, we designed our study to focus on the other demographic factors, prevalent in Pakistani society, and their effect on the link between birth order and the disease.

## METHODOLOGY

This was a cross sectional study. The Twelve hundred eight patient's data was recorded who had attended psychiatric department (in-patient and out-patient) at Isra University Hospital for consultation, from January 2002 to February 2004. Isra University Hospital is located at the junction of Hyderabad city and rest of the interior of Sindh province; connecting many cities, small towns and rural areas. Thus Isra University Hospital caters the health needs of all types of catchment areas. Therefore sample of this study was a representative part of target population.

A proforma on which demographic characteristics, diagnosis and birth order was recorded, was developed. Diagnosis had already been done on the basis of ICD-10, using present state examination. As the data had been collected much earlier before we designed the study on birth order, the chances of experimental bias are reduced.

*Inclusion Criteria:* Each patient with, the diagnosis of Schizophrenia, or other diagnoses irrespective to the age, gender, social class, or family type; was included in the study.

*Exclusion Criteria:* History of polygamy in parents; Dual diagnosis; suspicion of organicity contributing to the psychopathology; only child and Twin births were excluded from the study.

In order to facilitate the research on the data, every patient or their accompanied legal guardians had already been asked for the consent to use this data in future studies with-out breaching confidentiality. In addition approval from the ethical committee of Isra University was also obtained before started working on the data. Data thus obtained was then subjected to analysis on SPSS 13th version using Chi Square tests, Odd's Ratio, and Relative Risks; where ever required.

## RESULTS

Table-I depicts the break-up of Schizophrenia among birth orders; and comparison with corresponding frequencies in the whole sample. It is evident that in the whole sample Schizo-

Table-I: Birth Order V/S Diagnosis

| Birth Orders | Diagnosis | | | Total (%) |
|---|---|---|---|---|
| | Schizophrenia (%) | Other Diagnosis (%) | P –value | |
| One | 20 (1.65) | 284 (23.5) | 0.874 | 304 (25.2) |
| Two | 26 (2.15) | 367 (30.4) | 0.864 | 393 (32.5) |
| Last | 25 (2.07) | 361 (29.9) | 0.768 | 386 (32) |
| Others | 11 (0.93) | 114 (9.4) | 0.348 | 125 (10.3) |
| Total | 82 (6.8) | 1126(93.2) | | 1208 (100) |

Table-II: Birth Order v/s Gender

| Gender | | | Diagnoses | | | Total |
|---|---|---|---|---|---|---|
| | | | Schizophrenia | Other Diagnoses | P -value | |
| Male | Birth order | First | 5 (1%) | 157 (30.9%) | 0.027* | 162 (31.9%) |
| | | Second | 15 (2.9%) | 160 (31.5%) | 0.217 | 175 (34.4%) |
| | | Last | 14 (2.8%) | 157 (30.9%) | 0.328 | 171 (33.7%) |
| | | Total | 34 (6.7%) | 474 (93.3%) | | 508 (100%) |
| Female | Birth order | First | 15 (2.6%) | 127 (22.1%) | 0.020* | 142 (24.7%) |
| | | Second | 11 (1.9%) | 207 (36%) | 0.293 | 218 (37.9%) |
| | | Last | 11 (1.9%) | 204 (35.5%) | 0.325 | 215 (37.4%) |
| | | Total | 37 (6.4%) | 538 (93.6%) | | 575 (100%) |

For the sake of better analyses, "others" have been omitted.
*Statistically Significant as P-value <0.05

phrenia is equally distributed among all the birth orders from one to last v.i.z 1.65%, 2.15% and 2.07%, respectively.

Table-II shows the birth orders affected by the disease and the comparison among males and females. It appears that first-born males are least affected while last-born and second-born carry almost the same risk. On the other hand first-born females are most affected, and the rest of the birth orders carry equal risk. On tests of significances these findings do not reach the levels of significance, as see in Table-II.

Table-III shows the cross tabulation of birth orders and diagnoses in terms of Catchment areas. It seems that in our sample population, first-born urban population carry maximum risk of being affected by schizophrenia, while last-born belonging to urban areas carry minimum risk.

On the other hand among the patients coming from rural areas first-born are least affected and last-born are maximally affected with the disease. Theses findings are not statistically significant.

Table-IV shows the same population in terms of family type. First-born in nuclear families appear to be maximally affected (10.3%) in our studied sample; while last-born are least likely to develop the illness (7.8%). On looking at the population living in joint families; birth order-one are least likely to have the illness (3.6%) as compared to the rest of the birth orders and last-borns are most likely to develop the illness (6.7%). Over all safest population in our sample proved to be the first-born in joint families. On analyzing the findings using Pearson chi-square tests and likelihood ratio these findings are

Table-III: Birth Order V/S Catchment Area

| Catchment Area | | | Diagnoses | | | Total |
|---|---|---|---|---|---|---|
| | | | Schizophrenia | Other Diagnoses | P -value | |
| Urban | Birth order | First | 16 (3.1%) | 147 (28.5%) | 0.047* | 163 (31.6%) |
| | | Second | 12 (2.3%) | 171 (33.2%) | 0.970 | 183 (35.5%) |
| | | Last | 6 (1.2%) | 163 (31.7%) | 0.050 | 169 (32.9%) |
| | | Total | 34 (6.6%) | 481 (93.4%) | | 515 (100%) |
| Rural | Birth order | First | 4 (0.7%) | 137 (24.1%) | 0.041* | 141 (24.8%) |
| | | Second | 14 (2.5%) | 196 (34.5%) | 0.916 | 210 (37%) |
| | | Last | 19 (3.3%) | 198 (34.9%) | 0.086 | 217 (38.2%) |
| | | Total | 37 (6.5%) | 531 (93.5%) | | 568 (100%) |

For the sake of better analyses, "others" have been omitted.
*Statistically Significant as P-value <0.05

Table-IV: Birth Orders V/S Family Type

| Type of Family | | | Diagnoses | | | |
|---|---|---|---|---|---|---|
| | | | Schizophrenia | Other Diagnoses | P -value | Total |
| Joint | Birth order | First | 6 (1%) | 162 (27.2%) | 0.189 | 168 (28.2%) |
| | | Second | 13 (2.2%) | 206 (34.6%) | 0.738 | 219 (36.8%) |
| | | Last | 14 (2.3%) | 195 (32.7%) | 0.368 | 209 (35%) |
| | | Total | 33 (5.5%) | 563 (94.5%) | | 596 (100%) |
| Nuclear | Birth order | First | 14 (2.9%) | 122 (25.1%) | 0.200 | 136 (28%) |
| | | Second | 13 (2.7%) | 161 (33.1%) | 0.833 | 174 (35.8%) |
| | | Last | 11 (2.2%) | 166 (34%) | 0.325 | 177 (36.2%) |
| | | Total | 38 (7.8%) | 449 (92.2%) | | 487 (100%) |

For the sake of better analyses, "others" have been omitted

proved to be non significant. So we can say that there is no effect of birth order on developing Schizophrenia in any type of family.

## DISCUSSION

This study was aimed to explore the birth order risk in Schizophrenia and the way family type and catchment area affect this risk. Our findings do not confirm the findings in the study by Granville-Grossman[15]; that first-born males are least affected. If we consider that the finding in the Granville's study, could be related to the parenting pattern or environment in which boys are brought-up[22] and Sears' notions such as first-born are mostly breast fed than the rest of the birth orders; and that the first born gain maximum attention; we may attribute our finding to our cultural factors and practices. We do still have joint family system and even if the families are nuclear there is a great degree of cohesiveness. This same may nullify the effects, which are unique to first borns in western families, and contribute to findings we saw in their study. If we look at the same finding in the light of another factor which comes out from our sample of schizophrenics that first–born among joint families, although statistically not significant but are least effected and last born carry maximum risk. This observation is in contrast to the finding in the said study in that, first borns in the west are least affected, which mainly comprise of nuclear families. However in our study first born in nuclear families appear to have maximum

tendency of developing the illness. But this is just an observation, an not proven statistically.

Our findings are also not in line with the finding presented by Schooler[17], who identified later born females to be at higher risk of Schizophrenia. Rather if we look at Table-II; first-born females appear to have increased tendency for the illness (10.6% as compared to 5.0% second-borns and last borns); although not to the extent of statistical significance. Over all likelihood ratio of developing the illness in both genders remains the same.

Risk of Schizophrenia in urban and rural areas appears to be the same, in the study, but there is a dearth of information which can explain the findings in Table-III. First born are maximally affected in urban areas and least affected in rural areas. This is an interesting observation that risk of the illness seems to be decreasing with increasing birth order among urban population and just the reverse among rural patients. This finding also is not achieving statistical significance, but needs some attention. It may reflect predominant family type in both areas or rearing practices in these areas. When we analyze the data it is clear that the risk of Schizophrenia is uniform in all strata of our studied population.

## CONCLUSIONS

In our studied sample of schizophrenics; in general, distribution of the disease is uniform among all birth orders; in every class of our

society. Further studies are required to have better understanding of some of the questions which have come out in the findings of the study.

*Authors Contribution:* MAA conceived, collected data, and designed, contributed in manuscript writing RUR, AAS, SZH did statistical analysis & contributed in manuscript writing. All did review and have approved the final manuscript for publication

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