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A Study on the Effects of Seasonal Variation on Schizophrenia.

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ABSTRACT

Background: Previous studies have shown that schizophrenic patients are more likely to be born in winter and early spring months than the general population. Thus emerged the hypothesis that winter births confer significant risk for developing schizophrenia. This result has been consistent in the northern hemisphere but is still controversial in the southern hemisphere. Aim: To study the correlation between seasonality and the number of births of patients with schizophrenia. **Methods:** 25 cases of people with schizophrenia whose month of birth was known were selected at the Department of Psychiatry, TVMCH. Their attender served as controls. Semi-structured proforma which gives details about the name, age, sex, place, education, occupation, type of schizophrenia, the age of onset of the illness, birth season. **Results:** It was found that there is a statistically non-significant increase of 12% in winter births, 8% in summer births and a decrease of 20% in monsoon births among schizophrenics compared to the control. **Conclusion:** The people with schizophrenia in our state tend to be born in extremes of seasons rather than the monsoon. Further studies with larger sample size need to be conducted to obtain a statistically significant data, which may lead to the origin of interesting theories about the development of the brain and the causes of schizophrenia.

Keywords: Schizophrenia, birth season, chronobiology.

INTRODUCTION

Schizophrenia is a mental disorder defined by the malfunction of thought processes and by bad emotional responsiveness. It commonly manifests itself as auditory hallucinations, paranoid or bizarre delusions, or disorganized speech and thinking, and it is described by significant social or occupational dysfunction.[1] The onset of symptoms typically occurs in young adulthood, with a global lifetime prevalence of about 0.3–0.7%. The normal life expectancy of people with the disorder is 12 to 15 years less than those without, the result of enhanced physical health problems and a larger suicide rate.[2] The problems of schizophrenia have been the subject of much debate, which is to be exacted, considering the well-known saying that "the only organ that is not fully realized is 'The Brain." Agreeing that it results from a combination of both brain vulnerability (inherited or acquired) and life events, the scientific debate now focuses on how much each of the factors contributes to the development. Factors such as middle ear disease, the estrogen hormone, birth order, genes, maternal stress, viral infections, celiac disease have been studied and associated with schizophrenia. One such debatable factor is seasonality of birth.[3] The epidemiological finding is that people diagnosed with schizophrenia are more likely to have been born in winter and spring compared to the general population (at least in the northern hemisphere).[4]

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Aim

The objective of the present study was to investigate the correlation between seasonality and the number of births of patients with schizophrenia

MATERIALS AND METHODS

The research methodology was approved by the ethical committee of Tirunelveli Medical College. 25 Cases were selected from the Department of Psychiatry, Tirunelveli Medical College.

Inclusion criteria

Diagnosis of schizophrenia confirmed by the ICD - 10 criteria, calm and co-operative patients with reliable attenders, patients giving voluntary consent.

Exclusion criteria

Patients without attenders, cases where the birth season is not known.

Semi-structured proforma which gives details about the name, age, sex, place, education, occupation, type of schizophrenia, the age of onset of the illness, birth season.

The case-control study was comparing the birth season of 25 cases of schizophrenia with 50 controls without any psychiatric history. The research hypothesis to be studied is that there is an excess of winter birth in schizophrenics compared to the general population and there is an association between winter birth schizophrenia. Therefore the null hypothesis is taken as there is no relation between winter birth and schizophrenia.

RESULTS

32 % of the cases are female, 68% are male, 28% belong to the age group 20-30, 52% belong to the age group 30-40, 5% belong to the age group 40-50.

Persons accompanying the patients served as controls. 50 controls without any history of psychiatric illness were selected.

There is an increase of 12% in winter births among schizophrenics compared to the control. There is an increase of 8% in summer births among schizophrenics compared to the control. There is a decrease of 20% in monsoon births among schizophrenics compared to the control.

Table 2 shows that the association with winter birth is slightly greater in schizophrenics with earlier onset of the illness than those with late onset. The odds ratio of the schizophrenics being winter born is 1.78 with 95% confidence interval of 0.62 - 5.05. The odds ratio of the schizophrenics being monsoon born is 0.43 with 95% confidence interval of 0.15 - 1.18. From the confidence interval, we see that the results are not statistically significant. The p-value for winter birth computed by Fischer's test is 0.28 which again confirms that it is not significant.

Table 1: Birth season in schizophrenics and control

Birth season	Control	Control (%)	Schizophrenics	Schizophrenic (%)
Winter (Nov-Feb)	12	24%	9	36%
Summer (Mar-Jun)	12	24%	8	32%
Monsoon (July-Oct)	26	52%	8	32%
Total	50	100%	25	100%

Table 2: Comparison of winter birth in schizophrenics with earlier onset and late onset

Age of onset of illness	No of schizophrenics	%	Winter birth %
Less than 30	16	64	37
More than 30	9	36	33

Table 3: Contingency table for Fischers test

	Winter births	Non winter births
Schizophrenics	9	16
Non schizophrenics	12	38

DISCUSSION

Our study shows that there is an increase of 12% in winter births among schizophrenics compared to the control. The association between winter birth and schizophrenia is more in those with earlier onset of illness than the late onset. The odds ratio for winter birth is 1.78 i.e. the odds of schizophrenics being winter born is 1.78 times (nearly twice) greater for schizophrenics compared to non- schizophrenics. But using this sample size, we may only say that in real population it may be between 0.62 5.05 (95% confidence interval). The p-value computed by Fischer's test is 0.28. Therefore there is not enough proof to reject the null hypothesis. i.e. there may or may not be a relation between winter birth and schizophrenia. A meta-analysis from 2003, which analyzed eight studies about the season of birth and schizophrenia in the northern hemisphere, found that there was a pooled odds ratio (OR) of 1.07 and an attributable population risk of 3.3 percent for winter/spring birth.[5] In addition, a widely replicated risk factor for schizophrenia is birth in the winter. The tendency for schizophrenia patients to be more likely than controls to be born in the winter, rather than other seasons, increases with latitude and severity of winter climate.[6-8]

However, the excess of winter birth in our state where winter is not really distinct is still remarkable. Also, that the odds ratio is the least for monsoon than any other seasons. For some reasons schizophrenics are tend to be born in extremes of season (summer and winter) rather than monsoon. Climatic stress may add up with other maternal factors like psychological stress, nutritional deficiency, infection etc. which leave the baby mentally weak and vulnerable, predisposing them to the development of schizophrenia later in life when faced with difficult, stressful events. Many promising theories about the causes of schizophrenia are evolving based on the association between winter birth and schizophrenia. These include vitamin D deficiencies due to reduced sun exposure in winter, increased influenza infections, maternal-fetal chronobiological dysfunction hypothesis (reduced melatonin concentration, thermostat dysfunction leading to an increased phasic release of dopamine)

The prevalence of vitamin D deficiency increases with latitude and cold climate because exposure of the skin to UVB radiation in sunlight is the major

natural source of vitamin D, and the reduced hours and intensity of sunlight at higher latitudes make it difficult for people to generate enough vitamin D, especially in winter months. Cold climate is an additional risk factor for vitamin D deficiency because cold weather.[9,10]

The main disadvantage of the study is sample bias, the sample selected is not representative of the whole population. A larger sample would have yielded better results. Measures have been made to eliminate recall bias, as much as possible.

CONCLUSION

The people with schizophrenia in our state tend to be born in extremes of seasons rather than the monsoon. Further studies with larger sample size need to be conducted to obtain a statistically significant data, which may lead to the origin of interesting theories about the development of the brain and the causes of schizophrenia. Depicting the personality from the birth month is not an entirely new notion for man. Whether we call it astrology or seasonal biology, some relation exists between birth season and mental health and is yet to be discovered.

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