Original Article

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Comparative Study of Minor Physical Anomalies in Late Onset Schizophrenia

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Abstract

Background: Minor physical anomalies are considered as neurodevelopmental abnormalities. The frequency of minor physical anomalies was considerably higher in patients with schizophrenia as compared to healthy controls. *Aims:* To compare the frequency of minor physical anomaliess in late onset schizophrenia and healthy control group. *Methodology:* This study was Hospital based cross sectional comparative study by purposive sampling method which included 41 patients with late onset schizophrenia and 41 healthy controls assessed on Waldrop's Minor physical anomalies scale. *Results:* 63.4% (26) of the cases with late onset schizophrenia had one or the other minor physical anomalies and adherent ear lobe was the most common MPA which is statistically significant as compared to healthy controls. *Conclusions:* Presence of more minor physical anomalies in late onset schizophrenia indicates the possible neurodevelopmental etiology similar to early onset schizophrenia.

Keywords: Minor physical anomalies; Schizophrenia

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Introduction

When we look at the neurodevelopment perspective of schizophrenia researches noted that the frequency of minor physical anomalies was considerably higher in patient population as compared to healthy controls and it is considered as an endophenotypic marker of schizophrenia. According to Weinberger (1987)[1] minor physical anomalies are considered as neurodevelopmental abnormalities based on the facts that

1. Most minor physical anomalies and central nervous system originate in the same germ layer, i.e. ectoderm.
2. There is an overlap between the timing of minor physical anomalies generation and the appearance of abnormal brain development in schizophrenia, i.e. during the first and/or early second trimesters of gestation.

Some of the studies[2,3,4] noted that there is significantly increased prevalence of minor physical anomalies in patients with schizophrenia. Late onset schizophrenia has been identified as distinct diagnostic category, however the etiology for the same remains unclear. Studies were lacking in this field to identify the role of minor physical anomalies.

However, some other studies[5,6] noted higher number of minor physical anomalies in persons with late onset schizophrenia and proposed the possiblity of neurodevelopmental etiology for the same.

Materials and Methods

The study was conducted at a tertiary referral center for acute psychiatric hospitalizations and outpatient services within its catchment area which

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includes Karnataka, Tamil Nadu, Andhra Pradesh, Kerala. The protocol for the study was submitted to and approved by the institutional ethical committee.

Study Sample and Design

This is a Hospital based cross sectional comparative study and subjects were recruited by purposive sampling method. Written informed consent was obtained before the assessment. The experimental group comprising of 41 patients between the age groups of 40 to 60 with diagnosis of schizophrenia based on DSM-5 criteria and onset of illness after 40. Forty-one age and sex matched healthy controls were recruited for comparison group. Those who had acquired physical deformities which can confound the assessment of minor physical anomalies were excluded from the study.

Tools Used for Assessment

Modified Minor Physical Anomalies (MPA) scale[7] was used for the assessment. This scale was initially developed by Waldrop et al. (1968)[7] which was based on the assessment of physical characteristics in Downs syndrome. Later on with various modifications it was used in schizophrenia and other psychiatric disorders. The modified scale includes covered epicanthus, adherent ear lobes, asymmetric ear lobes, high arched palate, furrowed tongue, single palmar transverse crease, head circumference, hypertelorism, low set ear, curved fifth finger long third toe. We also included presence or absence of MPA in study subjects and total MPA per person.

Data Processing and Analysis

Data was processed using Statistical Package of Social Sciences – version 16.0 (SPSS-16). Continuous variables were expressed using descriptive statistics as mean, standard deviation (SD) and frequency percentage for categorical variables.

Chi-square test was used to compare the frequency of minor physical anomalies among study groups.

Results

Sociodemographic characteristics: Majority of the patients in the study group were females, mean age of them was comparable and controls subjects were more educated as compared to cases (Table 1).

Table 1: Sample characteristics for socio-demographic variables (continuous) among study groups

		Mean	Std. deviation
Age in years (*N* = 41)	Cases	49.97	5.24
	Controls	50.12	5.75
Education in years (*N* = 41)	Cases	4.43	4.92
	Controls	7.21	5.34

Table 2: Comparision of socio-demographic variables (categorical) among the study groups

		Patient total 41 (%)	Control total 41 (%)	Total	Chi-square	*P*
Sex	Male	9 (22)	9 (22)	18	0.00	1
	Female	32 (78)	32 (78)	64		
Marital Status	Single	1 (2.4)	0	1	7.536	<0.05#
	Married	36 (87.8)	32 (78)	68		
	Seperated	3 (7.3)	1 (2.4)	4		
	Widowed	1 (2.4)	8 (19.5)	9		
Occupation	Employed	38 (92.6)	40 (97.5)	78	15.142	<0.01#
	Unemployed	3 (7.3)	1 (2.4)	4		
Residence	Rural	23 (56.1)	10 (24.4)	33	10.37	<0.01
	Semiurban	6 (14.6)	5 (12.1)	11		
	Urban	12 (29.3)	26 (63.4)	38		
Nicotine	Nil	23 (56.1)	36 (87.8)	59	11.561	<0.01
	Abuse	10 (24.4)	1 (2.4)	11		
	Dependence	8 (19.5)	4 (9.8)	12		

#Cell count less than 5. Fisher's exact test applied

Table 3: Chi-square test for minor physical anomalies

		Patient (%)	Control (%)	Total	Chi-square	*P*
Covered epicanthus	Absent	41 (100)	41 (100)	82		
Adherent ear lobes	Absent	29 (70.7)	37 (90.2)	66	4.97	<0.05
	Present	12 (29.3)	4 (9.8)	16		
Asymmetric ear lobes	Absent	39 (95.1)	39 (95.1)	78	0.00	1
	Present	2 (4.9)	2 (4.9)	4		
High arched palate	Absent	38 (92.7)	41 (100)	79	3.114	0.08
	Present	3 (7.3)	0	3		
Furrowed tongue	Absent	31 (75.6)	34 (82.9)	65	0.668	0.41
	Present	10 (24.4)	7 (17.1)	17		
Single palmar transverse crease	Absent	40 (97.6)	41 (100)	81	1.012	0.314
	Present	1 (2.4)	0	1		
Hypertelorism	Absent	41 (100)	41 (100)	82		
Low seated ears	Absent	39 (95.1)	40 (97.6)	79	0.346	0.56
	Present	2 (4.9)	1 (2.4)	3		
Curved fifth finger	Absent	38 (92.7)	38 (92.7)	76	0.00	1
	Present	3 (7.3)	3 (7.3)	6		
Long third toe	Absent	40 (97.6)	41 (100)	81	1.012	0.314
	Present	1 (2.4)	0	1		
Minor physical anomaly	Absent	15 (36.6)	26 (63.4)	41	5.902	<0.05
	Present	26 (63.4)	15 (36.6)	41		

The comparison of marital status, occupation, residence and nicotine use showed significant difference among the study groups. Majority of them were married, belonged to nuclear family, living in rural area, and are employed (Table 2).

Discussion

Minor physical anomalies indicates variations in superficial bodily structures in the head face, eye, ear, mouth, hand and foot which are subtle in nature and may not be given much attention in routine clinical examinations unless specifically looked for. So it indicates the interaction between genetic and environmental factors in the genesis of minor physical anomalies in prenatal period (Table 3).

Higher prevalence of minor physical anomalies was noted in patients with schizophrenia in the younger age group[8,9] and considered them as endophenotypic marker which supports the neurodevelopmental hypothesis of schizophrenia.

As Late onset schizophrenia shares similar clinical features as that of early onset schizophrenia attempts were made to identify the possible neurodevelopmental etiology in this group also. Only few studies in this field shown higher presence of minor physical anomalies in patients with Late onset schizophrenia.[5,6]

Using the standard scale, our study replicated the findings of previous studies which shows the presence of minor physical anomalies in 63.4% (26) of the cases and thus provide the additional evidence to support the neurodevelopmental etiology of late onset schizophrenia.

Limitations and Future Directions

Sample size was small and Inter-rater reliability was not assessed.

Future studies may include larger sample to generalize the findings. Neuroimaging studies needs to be considered to assess for age-related structural changes in late onset schizophrenia group.

Conclusion

Being endophenotypic marker of schizophrenia, increased frequency of minor physical anomalies in late onset schizophrenia as compared to healthy controls supports the role of neurodevelopmental factors in the etiology of this diagnostic category.

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