

## MINOR PHYSICAL ANOMALIES IN SCHIZOPHRENIA

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### SUMMARY

Minor Physical Anomalies have been described as a slight deviation in appearances from essential physical characteristics. Presence of multiple anomalies suggests a developmental deviation of ectodermal structures developing in the first trimester, also the time of development of the brain. Presence of minor physical anomalies in Schizophrenia have been investigated in this study and the incidence was found to be significantly high. This raises the possibility of intrauterine developmental defects in Schizophrenics.

### Introduction

Schizophrenia is an intriguing disease in many respects. Over a hundred years have passed since this condition was delineated, yet we are not close to any definite answers regarding its etiology.

Investigations along two lines are being pursued regarding its etiology – the organic biological model and the environmental psychological model. Both inheritable and non-inheritable organic factors have been implicated at different times in the etiology. However, exactly what is inherited is not known. Certain authors believe that a constitutional predisposition to schizophrenia is inherited, and in the face of stresses these individuals breakdown and become schizophrenic. Amongst the non-genetic factors, teratogenic insults to the fetus during the first trimester have often been implicated (Wender 1972, Warkany 1961, Campbell 1978).

One of the tools which indicates that a first trimester aberration has taken place is the presence of Minor Physical Anomalies (MPA). Waldrop and Halverson (1971) have compiled a list of MPA involving the ectodermal structures. These include 'electric hair' that cannot be combed down, abnormal sized heads, epicanthus,

hypertelorism, low seated ears, adherent ear lobes, high steeped mouth and furrowed tongues. Defects in the limbs include a curved fifth finger, single transverse palmar crease, syndactylia of toes, a large gap between the first and second toes and unusually long third toe. Each of the anomalies in this scale is given a weighted score ranging from 0-2. The sum total of the weighted scores would then give an appraisal of the number of anomalies in a particular subject.

These anomalies have been shown to be present in significant numbers in various developmental disorders. These include idiopathic mental retardation, hyperactive autistic children and also speech/hearing impaired children (Firestone and Peters 1983). A prospective study (Fish 1957) had shown that a child with abnormalities in neurological and physiological maturation apparent as early as one month of age later went on to develop Schizophrenia. Whereas, a score of 2-4 has been reported in normal human beings (Waldrop et al. 1968), the Waldrop scores have always been higher in the schizophrenic samples (Campbell et al. 1978, Walker 1977, Guy et al. 1983).

There are conflicting reports regarding

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sex differences in the MPA scores. Whereas some authors have reported a higher incidence in males (Waldrop and Goering 1971), others have been unable to find any such correlation (Halverson and Victor 1976, O'Donnell et al. 1979). A positive correlation between early onset schizophrenia and MPA has been shown to exist (Evans et al. 1973, Steg et al. 1975).

However all the above mentioned studies have been done on subjects of Western origin. To the best of the authors knowledge this is the first study investigating the incidence of MPAs in Asian schizophrenic subjects. This study was undertaken to compare the incidence of minor physical anomalies between the following groups:

- normal and schizophrenic subjects
- male and female schizophrenics
- early and late onset schizophrenia
- paranoid and non-paranoid schizophrenic subjects.

#### *Experimental Group*

Patients were selected at random from the inpatient population of the Central Institute of Psychiatry, Ranchi. All subjects were between 18-60 years of age, as verified by the hospital records. Those belonging to the mongoloid races were eliminated to avoid contamination due to racial differences. A total of 50 males and 30 females were eventually selected for the study. All fulfilled the Research Diagnostic Criteria for Schizophrenia.

#### *Control Group*

Comprised of one first degree relative of each of the patients selected in the experimental group. This was done to eliminate any possible genetic differences in the incidence of MPAs between the two groups. They were also matched for sex.

*Procedure:* Consent for testing of the

anomalies was obtained from all the patients selected for this study. They were then examined and Waldrop scores obtained. The case record file of each subject was thereafter reviewed and the diagnosis of each patient (paranoid vs. non-paranoid) noted. The age of onset of the illness was also noted and those having onset prior to the age of 20 years were identified as the early onset cases.

### **Results**

The incidence of minor physical anomalies in a subject was represented by the Waldrop scores. The number and severity of anomalies was directly proportional to the scores. Ages have been rounded off to the nearest year. The 't' test was used to compare the significance of the results.

The score in the schizophrenic sample was significantly higher ( $p < .005$ ) than the normal controls. Within the schizophrenic group itself, higher scores were seen

Table 1

Sample	Mean Waldrop score	p = Value
Schizophrenic (N = 80)	6.8 (S. D = 2.00)	t = 13.0 p = <.005
Normal Control (N = 80)	2.9 (S. D = 1.76)	

Waldrop Score comparison between schizophrenic and normal groups.

in the early onset cases, as predicted, but the results did not achieve statistical significance. Although there was a negligible difference between the paranoid and the non-paranoid sample, the difference was statistically significant when only the female sample was considered. The Waldrop score for males was 6.5 and this was much lower ( $p < .05$ ) than that seen in the females (7.5).

Table 2

Sample	N	Mean Waldrop score	P
Schizophrenia patients			
1. Paranoid	27	7.2 (S. D = 1.93)	$t = 1.51$
Non-Paranoid	53	6.5 (S. D = 1.99)	$p = NS$
2. Female paranoid	10	8.3 (S. D = 1.95)	$t = 2.15$
Female non-paranoid	20	6.7 (S. D = 1.87)	$p < .05$
3. Male	50	6.46 (S. D = 1.93)	$t = 2.20$
Female	30	7.48 (S. D = 2.06)	$p < .05$
4. Early onset	30	7.0 (S. D = 1.81)	$t = 1.13$
Late onset	50	6.5 (S. D = 2.07)	$p = NS$

### Discussion

Minor Physical Anomalies are not known to affect the brain function or behaviour directly, but only serves to indicate the possibility of a first trimester development anomaly in the fetus. This is also the most critical period of development for the brain.

In this study, almost 90% of the schizophrenic subjects were seen to have a Waldrop score higher than what has been reported for normals (4). This gives some evidence that a first trimester aberration in the fetal development may make an individual more susceptible to the eventual development of schizophrenia. Pending further research, exactly why this should be so, is left to speculation. It may lead to a neurotransmitter dysfunction, a deficiency in the auto-immune system or defects in the energy metabolism; all implicated in the etiology of Schizophrenia.

Contrary to some of the previous reports, this study finds an increased incidence of MPAs in females. Another significant finding has been the higher scores in the paranoid subgroup of the schizophrenic patients. This would indicate an increased role of an organic neurological impairment in the paranoid schizophrenic patients, and leads one to speculate about the possibility of paranoid schizophrenia being a distinct

entity, vis-a-vis the non-paranoid types of schizophrenia.

Although it has now been established beyond any reasonable doubt that there is an increased incidence of MPAs in schizophrenic patients, one needs to investigate whether the degree of such disorders indicate a differential response to drugs and the other methods of treatment. The presence of MPAs could also be a useful tool for an early identification of susceptible individuals.

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