PREVALENCE OF NEUROLOGICAL "SOFT SIGNS" IN AFFECTIVE DISORDER AND THEIR CORRELATION WITH RESPONSE TO TREATMENT

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SUMMARY

A prospective study was undertaken in fifty patients who were diagnosed to have major affective disorder, to assess the prevalence of neurological soft signs, their localization and their correlation with response to treatment. Neurological soft signs have been shown to be very common in major affective disorder. They were mainly localized in the temporal and parietal lobes. There was no difference between depressed and manic patients. There was no correlation between the presence of soft signs and response to treatment. These soft signs may be nonspecific signs of psychosis. It has not been possible to assess whether neuroleptic use can explain the presence of neurological soft signs by the present study.

A neurological soft sign is a particular form of deviant performance on a motor or sensory test in the neurological status examination. The designation "soft" is usually taken to indicate that the person with the sign shows no other features of a fixed or transient neurological lesion or disorders. The clinical importance of soft sign is not in any impairment of motor or sensory function associated with their presence, for there does not seem to be any, but in their value as an indicator of some CNS factors, that might have causal or predictive value for associated psychological dysfunction and in particular learning and/or psychiatric abnormalities (Shaffer, et al., 1983). High incidence of neurological soft signs have been reported in minimal brain dysfunction (Clements et al., 1962; Wikler et al., 1970), emotionally unstable character disorders (Quitkin et al., 1976) hysteria (Benfeldt et al., 1976) heavy poly drug users (Grant et al., 1976) and consistently so in schizophrenia (Gur, 1977). Rockford et al. (1970) and Cox and Ludwig (1979) studied patients with alcoholism, unipolar depression, bipolar illness, schizophrenia and mixed neurotic disorders. Schizophrenia was the only group in which the incidence of specific soft signs was significantly present. Nasarallah et al. (1982) reported that the soft signs are as common in mania as in schizophrenia. Mukherjee et al. (1984) also has reported neurological soft signs in bipolar disorder. Keshavan et al. (1979) reported that primitive neurological soft signs like grasp, snout and palmarmental reflexes are present in a considerable number of older people and in organic and functional psychosis.

The presence of neurological soft signs in affective disorder is poorly studied, scanty and controversial. The present study was aimed at achieving further data on the prevalence and localization of neurological soft signs in affective disorder.

AIMS

1. to study the prevalence of neurological soft signs in major affective disorder;
2. to study their localization;
3. to study their correlation with response to treatment.

METHODOLOGY

50 patients, both outpatients and inpatients who fulfilled the research diagnostic criteria (Spitzer et al., 1978) for major affective disorder (mania or depression) formed
20 people were chosen as normal controls, after they were screened for any evidence of psychiatric or physical disorders.

The following were the exclusion criteria: organic brain syndrome, major physical illness, ECT within the previous six months, impairment of sense of smell, hearing or vision, alcohol or drug dependence, mental retardation, impairment of attention and concentration and un-cooperative patients.

Detailed data collection was done at the beginning. The severity of illness and response to treatment were recorded at weekly intervals using depression rating scale (Hamilton, 1960) and Modified Mania rating scale (Blackburn et al., 1977). Tests for presence of neurological soft signs were done on all the patients. Patients were treated with antipsychotics, antidepressants, lithium or carbamazepine. A few patients were given ECT, but psychological tests were done prior to that. Response to treatment was recorded as good, moderate or poor depending on the score on the rating scale. Patient scoring less than ten on the rating scales was considered as showing good response.

Neurological Soft Signs
(Cox and Ludwig, 1979)

The testing was done by the same rater on all patients and controls. Testing was done in one session. An average of one hour and fifteen minutes was taken for each session. Neurological soft signs were assessed using the condensed Neuropsychiatric Examination (Cox and Ludwig, 1979). The degree of abnormality in the soft signs was rated from 0 (absent) to 3, 4 or 5 (severe) depending on the type of test and the number of patient errors on the particular test item.

Frontal lobe signs
1. Grasp reflex
2. Palmo mental reflex
3. Visual perseveration of spoken commands
4. Conceptualization and follow through of difficult tasks
5. Mnestic disturbance due to poor effort or due to perseveration

Parietal lobe signs
1. Complex Motor act
2. Imaginary acts
3. Oral apraxia
4. Blunt Vs. Sharp discrimination
5. Simultaneous bilateral tactile extinction
6. Two object test
7. Astereognosis

Temporal lobe signs
1. Memory
2. Optokinetic Nystagmus
3. Draw a face test
4. Failure to recognize anomalies
5. Tapping rhythm test
6. Reproduction of oppositional and correlating phenemes

Occipital lobe signs
1. Visual fields
2. Optic gnosia
3. Optic agnosia

Statistical Methods

Statistical analysis was done by using students ‘t’ test for testing differences between the means. Chi square test was used to test association between the groups. Correlation coefficient was calculated to find the intensity of relationship between two scores. Test for the significance of correlation coefficient was also done.

RESULTS

There were 34 males and 16 females between 18 and 60 years, in the experimental group. The control group consisted of 11 males and 9 females. There were 27 patients
with mania and 23 patients with depression at the time of the study. The patients and controls were matched for age, education and socioeconomic status.

**Table I. Age distribution among males & females**

|        | Controls |         | Patients |         |
|--------|----------|---------|----------|---------|
|        | M  | F  | T  | %  | M  | F  | T  | %  |
| Upto 20| 0  | 1  | 1  | 5  | 4  | 1  | 5  | 10 |
| 21—30  | 3  | 6  | 9  | 45 | 11 | 6  | 17 | 34 |
| 31—40  | 3  | 1  | 4  | 20 | 11 | 6  | 17 | 34 |
| 41—50  | 2  | 2  | 4  | 20 | 4  | 2  | 6  | 12 |
| 51—60  | 1  | 1  | 2  | 10 | 4  | 1  | 5  | 10 |
| Total  | 9  | 11 | 20 | 100| 34 | 16 | 50 | 100|

**Table II. Economic status**

|                   | Controls |         | Patients |         |
|-------------------|----------|---------|----------|---------|
|                   | No. | %    | No. | %    |
| Low Middle Class  | 2   | 10   | 8   | 16   |
| Middle Class      | 13  | 65   | 29  | 58   |
| Upper Middle Class| 5   | 25   | 13  | 26   |
| Total             | 20  | 100  | 50  | 100  |

**Table III. Educational status**

|                      | Controls |         | Patients |         |
|----------------------|----------|---------|----------|---------|
|                      | No. | %    | No. | %    |
| High School and Below| 10  | 50   | 27  | 54   |
| Above High School    | 10  | 50   | 23  | 46   |
| Total                | 20  | 100  | 50  | 100  |

**Frontal lobe signs**

40% of patients and 45% of controls showed frontal lobe signs when scoring on points were used.

Mean for patients 0.64  (S.D. = 0.93)
Mean for controls 0.70  (S.D. = 0.95)

**Parietal lobe signs**

45% of controls showed parietal lobe signs whereas 94% of patients showed parietal lobe signs. Scoring on points showed—

Mean for patients 3.24  (S.D. = 2.04)
Mean for controls 1.50  (S.D. = 1.89)

**Temporal lobe signs**

95% of patients and 70% of controls showed temporal lobe soft signs when scoring on points were used, it showed—

Mean for patients 6.26  (S.D. = 3.76)
Mean for controls 4.00  (S.D. = 2.70)

**Occipital lobe signs**

70% of the patients and 40% of control showed occipital lobe soft signs scoring on points showed—

Mean for patients 1.6  (S.D. = 1.4)
Mean for controls 0.85  (S.D. = 1.39)

There was no difference in the number of neurological soft signs between the two groups of patients, Mania and Depression.

There was no correlation between the number of neurological soft signs and response to treatment.

Total number of neurological soft signs present in patients were compared with the total number of neurological soft signs present in the control group. Neurological soft signs
### Table IV

|          | Depression |          | Mania |          |          |          |          |          |
|----------|------------|----------|--------|----------|----------|----------|----------|----------|
|          | Fron.      | Pari.    | Temp.  | Occi.    | Fron.    | Pari.    | Temp.    | Occi.    |
| Mean     | 0.54       | 2.70     | 6.44   | 1.45     | 0.75     | 3.4      | 6.05     | 1.8      |
| ST. DE.  | 0.88       | 2.29     | 3.38   | 1.53     | 0.96     | 2.29     | 3.05     | 1.54     |

### Table V. Response to treatment depression

| Frontal | Good | %  | Moderate | %  | Poor | % | No response | % |
|---------|------|----|----------|----|------|---|-------------|---|
|         |      |    |          |    |      |   |             |   |
| 0-1     | 17   | 85 | 2        | 10 | 1    | 5 | 1           |   |
| 2-3     | 5    | 100| —        |    |      |   | 1           |   |
| Total   | 22   |    | 2        | 1  | 1    |   | 2           |   |

| Parietal |      |    |          |    |      |   |             |   |
|----------|------|----|----------|----|------|---|-------------|---|
| 0-1      | 10   | 90.9| 1        | 9.1| —    |   | —           |   |
| 2-3      | 6    | 35.7| 1        | 14.3| —   |   | —           |   |
| 4-5      | 4    | 100 | —        |    |      |   | 1           |   |
| 6-7      | 1    | 100 | —        |    |      |   | 1           |   |
| 8-9      | 1    | 50  | —        |    |      |   | 50          |   |
| Total    | 22   |    | 2        | 1  | 1    |   | 2           |   |

| Temporal |      |    |          |    |      |   |             |   |
|----------|------|----|----------|----|------|---|-------------|---|
| 0-1      | 2    | 100| —        |    |      |   | —           |   |
| 2-3      | 2    | 100| —        |    |      |   | —           |   |
| 4-5      | 5    | 71.4| 1        | 14.3| 1    | 14.3| 1          |   |
| 6-7      | 5    | 100 | —        |    |      |   | —           |   |
| 8-9      | 4    | 80  | 1        | 20 | —    |   | —           |   |
| 10-11    | 4    | 100 | —        |    |      |   | 1           |   |
| Total    | 22   |    | 2        | 1  | 1    |   | 2           |   |

| Occipital |      |    |          |    |      |   |             |   |
|-----------|------|----|----------|----|------|---|-------------|---|
| 0-1       | 18   | 92.9| 1        | 7.1| —    |   | —           |   |
| 2-3       | 6    | 85.7| —        |    |      |   | 14.3        | 2 |
| 4-5       | 3    | 75.0| 1        | 25 | —    |   | —           |   |
| 6-7       | —    | —   | —        |    |      |   | —           |   |
| Total     | 22   |    | 2        | 1  | 1    |   | 2           |   |
### TABLE VI. Response to treatment mania

|        | Good | % | Moderate | % | Poor | % | No response |
|--------|------|---|----------|---|------|---|-------------|
| Frontal |      |   |          |   |      |   |             |
| 0-1    | 12   | 66.7 | 5 | 27.5 | 1 | 5.6 | 2 |
| 2-3    | 3    | 100 | — | —    | — | —   | — |
| Total  | 15   | 5  | 1       | 2 |
| Parietal |     |   |          |   |      |   |             |
| 0-1    | 3    | 60  | 1 | 20   | 1 | 20  | — |
| 2-3    | 4    | 57  | 3 | 43   | — | —   | 1 |
| 4-5    | 5    | 83  | 1 | 16.7 | — | —   | — |
| 6-7    | 1    | 100 | — | —    | — | —   | — |
| 8-9    | 2    | 100 | — | —    | — | —   | — |
| Total  | 15   | 5  | 1       | 2 |
| Temporal |     |   |          |   |      |   |             |
| 0-1    | 1    | 100 | — | —    | — | —   | — |
| 2-3    | 3    | 60  | 2 | 40   | — | —   | 1 |
| 4-5    | 4    | 100 | — | —    | — | —   | — |
| 6-7    | 3    | 75  | 1 | 25   | — | —   | 1 |
| 8-9    | 3    | 75  | — | —    | 1 | 25  | — |
| 10-11  | 1    | 33.3| 2 | 66.7 | — | —   | — |
| Total  | 15   | 5  | 1       | 2 |
| Occipital |     |   |          |   |      |   |             |
| 0-1    | 7    | 70  | 3 | 30   | — | —   | 1 |
| 2-3    | 8    | 88.9| 1 | 11.1 | — | —   | 1 |
| 4-5    | —    | —   | — | —    | — | —   | — |
| 6-7    | —    | —   | 1 | 100  | — | —   | — |
| Total  | 15   | 5  | 1       | 2 |

### TABLE VII. Soft signs

|                  | Frontal | Parietal | Temporal | Occipital |
|------------------|---------|----------|----------|-----------|
| Patients         | 45%     | 94%      | 95%      | 70%       |
| Controls         | 40%     | 45%      | 70%      | 40%       |
| t-value          | 0.6     | 2.8      | 2.57     | 1.5       |
| Sig.             | NS      | p<0.01   | p<0.05   | NS        |

were more prevalent in the patient group. The difference was statistically significant.

**DISCUSSION**

The main findings in this study are—patients with affective disorders have more neurological soft signs when compared to general population. This increased prevalence is statistically significant ($p<0.001$). The dysfunction is mainly shown in the temporal and parietal lobes. There was no difference in the performance between the groups, mania and depression. There was no correlation between the number of neurological soft signs and response to treatment.

The present study has shown that neurological soft signs are more common in affec-
tive disorders compared to general population. This finding is the same as in the study of Nasrallah et al. (1982). In the present study, it was also found that parietal and temporal lobes were more affected in affective disorders as compared to frontal and parietal lobes in schizophrenia (Cox and Ludwig, 1979).

It is possible that drug effect may account for neurological soft signs (Mukherjee et al., 1984). In the present study 41 patients had history of antipsychotic treatment. Nine patients were only on antidepressants. They also had neurological soft signs, but since the number of patients on antidepressants was small, no conclusion could be made.

Neurological soft signs have been described even in untreated pre-schizophrenic children (Fish, 1977). So it is more likely that the soft signs are related to pathophysiology of psychosis rather than due to drug treatment of psychosis. These soft signs do not seem to affect the patients response to treatment, according to this study.

The limitations of the present study are that most patients were on treatment with neuroleptic drugs and whether drugs could produce neurological soft signs cannot be ruled out. All patients were symptomatic during the study and were not tested after the remission of symptoms. Control group was small compared to the patient group.

REFERENCES

Benfeldt, F.; Miller, L. L. and Ludwig, A. M. (1976). Cognitive Performance in Conversion Hysteria. Archives of General Psychiatry, 33, 1250-1254.

Blackburn, I. M.; London, J. B. and Ashworth, C. M. (1977). A New scale for measuring mania. Psychological Medicine : 435.

Clements, S. and Peters, J. (1962). Minimal Brain Dysfunction in the school age child. Archives of General Psychiatry, 6, 17-29.

Cox, S. M. and Ludwig, A. M. (1979). Neurological soft signs and psychopathology—Findings in Schizophrenia. Journal of Nervous and Mental Disorders, Vol. 1676, 17-29.

Fish, B. (1977). Neurological Antecedents of Schizophrenia. Evidence for an inherited congenital Neurointegrative deficit. Archives of General Psychiatry, 34, 33-37.

Grant, I. M.; Miller, M. and Reital, R. W. (1976). A Neurological study of poly drug users. Archives of General Psychiatry, 33, 973-978.

Gur, R. E. (1977). Motoric laterality imbalance in schizophrenia. Archives of General Psychiatry, 34, 33-37.

Hamilton, M. (1960). Rating scale for Depression. Journal of Neurology, Neurosurgery & Psychiatry, 23, 56-62.

Keshavan, M. S.; Vikram Kumar, Y. and Channabasavanna, S. M. (1979). A critical evaluation of intantile reflexes in neuropsychiatric diagnoses. Indian Journal of Psychiatry, 21, 267-270.

Mukherjee, S.; Shukla, S. and Rosen, A. (1984). Neurological Abnormalities in patients with bipolar affective disorder. Biological Psychiatry, Vol. 19, 3, 337-345.

Nasrallah, H. A.; Tippin, J. and McCally, W. M. (1982). Neurological Soft Signs in Manic Patients: A comparison with Schizophrenia and control groups. Journal of Clinical Psychiatry, 43, 310-312.

Quitkin, F.; Fifkin, A. and Klein, D. (1976). Neurological soft signs in schizophrenia and character disorders. Archives of General Psychiatry, 33, 845-853.

Rockford, J.; Detre, T.; Ticker, G. and Harrow, J. (1970). Neuropsychological impairments in functional psychiatric diseases. Archives of General Psychiatry, 22, 114-119.

Shaffer, D.; O’Connor, P. A.; Schonfeld, I.; Stockman, G. and Trautman, P. (1985). Neurological soft signs, their relationship to psychiatric disorder and intelligence in childhood and adolescence. Archives of General Psychiatry, 42, 342-351.

Spitzer, R.; Endicott, J. and Robins, E. (1978). Research diagnostic criteria. Archives of General Psychiatry, 34, 773-782.

Wikler, A.; Dixon, J. and Parker, J. (1970). Brain Function in Problem children and controls. American Journal of Psychiatry, 127, 94-105.