

## THE STABILITY OF SYMPTOMS AND SYNDROMES IN CHRONIC SCHIZOPHRENIC PATIENTS

MILIND BORDE<sup>1</sup>, ELIZABETH J.B. DAVIS<sup>1</sup> AND L.N. SHARMA<sup>2</sup>

*36 chronic schizophrenic patients meeting D.S.M. III - R criteria were assessed by a single rater using the Positive and Negative Syndrome Scale (PANSS). Ratings were repeated 9 months later by the same rater. Negative symptoms and syndromes were much more stable over time than positive symptoms and syndromes. Only hallucinations had stability comparable to the negative symptoms. Positive and negative subtypes of schizophrenia based on the composite score were very stable. Relatively few symptoms from the general psychopathology subscale were stable over time. The implications of these findings are discussed.*

Ever since Kraepelin defined dementia praecox the illness has generally been regarded as a heterogenous group of disorders that share the common features of psychotic symptoms, partial response to neuroleptics and a relatively poor outcome. Unfortunately the traditional subtypes of schizophrenia i.e. hebephrenic, catatonic and paranoid have not helped to identify patients with a more homogenous course, outcome and response to treatment. Recent research suggests that subdivisions of schizophrenia based on the presence or absence of positive/negative symptoms may be more useful than the traditional subtypes (Andreasen 1990; Opler *et al.*, 1984; Kay and Singh, 1989).

Categorization of patients as having a positive/negative or other subtype of schizophrenia depends on the presence or absence of certain key symptoms. Positive symptoms are present in varying degrees of severity and negative symptoms may merge into normal behaviour (Johnstone, 1989). Arbitrary cut off points have been used to decide whether a symptom is sufficiently severe for the purpose of categorization. A slight change in the rating of an individual symptom which may be unstable over time, may change the subtype of a patient (Andreasen *et al.*, 1990). It is therefore important to know the relative stability of symptoms to decide which should be given more weightage in assigning patients to a particular subtype. An-

dreassen (1990) has reviewed positive-negative symptom research. She has stressed the differences between symptoms and syndromes and the need for longitudinal studies to assess their course and outcome.

Recent studies have examined the temporal stability of positive and negative symptoms and syndromes (Johnstone *et al.*, 1986; Kay & Singh 1989; Carpenter *et al.*, 1988). None of these studies involved the use of a specific detailed scale for the assessment of positive and negative symptoms administered by a single rater. The present study aims to examine the stability of positive, negative and other symptoms in a group of chronic schizophrenic patients over a period of 9 months. A standardized scale administered by a single rater is used. The stability of subtypes of schizophrenia based on positive and negative symptoms is also examined.

### METHOD

This study was conducted in the Central Institute of Psychiatry, Ranchi, India, in 1989-1990. The case notes of all long stay male patients were examined. 40 male patients meeting the following inclusion criteria were selected for the study:

- 1) Age 30-70 years.
- 2) Satisfies D.S.M. III - R criteria (American Psychiatric Association, 1987) for schizophrenia with a chronic course.
- 3) Duration of illness (defined as time since the onset of the first significant symptom) at least 5 years.
- 4) Duration of hospitalization at least 5 years.
- 5) Literate, reasonably cooperative and gave consent for testing.

The exclusion criteria were

- 1) Presence of significant medical and psychiatric illness other than schizophrenia, e.g. epilepsy, alcohol dependence, mental retardation.
- 2) Patients with a history of neurosurgical procedures or definite organic illness in the past.

This study was conducted in two phases. In phase I the 40 patients were assessed using the Positive and Negative Syndrome Scale (Kay *et al.*, 1987) (PANSS), by a single rater. This has been shown to be reliable and valid for the assessment of schizophrenic patients (Kay *et al.*, 1988). The PANSS contains a semi-structured prototype interview to assess the patient and has separate subscales for the assessment of positive symptoms, negative symptoms and general psychopathology. Ratings were based on the interview and on observed behaviour by nursing staff during the past one week. There are 7 items each in the positive and negative subscales and 16 items in the general psychopathology subscale. Each item is rated on a 7 point scale (1 absent to 7 extreme). Detailed anchoring points are given

The sum of all the negative or positive symptoms gives the negative or positive syndrome score respectively. The positive minus the negative syndrome score gives the composite score. This may be either positive or negative and can be used to classify patients as having either positive or negative schizophrenia. Alternatively a stringent method of classifying patients as Positive, Negative, Mixed or Indeterminate is available. Patients with at least 3 scores of moderate ( $\geq 4$ ) on the positive subscale and 3 scores of moderate on the negative subscale are classified as having positive schizophrenia. The converse holds true for negative schizophrenia. Those with at least 3 scores of moderate on both Positive and Negative subscales are classified as having mixed schizophrenia and those with 3 scores of moderate on both subscales are classified as indeterminate schizophrenia.

These 40 patients were also assessed on the Scale for Assessment of Negative Symptoms (Andreasen, 1983) and the Scale for Assessment of Positive Symptoms (Andreasen, 1984), by the same rater. This was to compare the PANSS with these scales (unpublished data). Only the data from the PANSS is considered in the present study.

The completion of the initial assessments ended phase I of the study. The data from the first phase were not analysed till the entire study had been completed. The second phase of assessments were carried out after a period of 9 months. The same patients were assessed using the same three scales in an identical manner by the same rater. Only 36 patients could be reassessed (3 had died and 1 had been discharged). In subsequent analyses only 36 patients assessed on both occasions are considered. It was not possible to keep the drug treatment unchanged over the study period. Most of the patients did not have treatment changes.

The data from both phases was analysed to assess the stability of each individual symptom and the stability of the positive and negative syndromes. The stability of the subtypes of schizophrenia based on the composite scores and those based on the stringent method were also assessed. These analysis were done using the intra class correlation coefficient (ICC), Kappa (K) or weighted Kappa (Kw) wherever appropriate (Bartko & Carpenter, 1976). Carpenter *et al.* (1988) have also used the ICC to measure stability of negative symptoms. The inter-correlations between Positive/Negative syndromes and demographic variables were assessed using Pearson's r. For this the mean(s) of the initial and final scores for each patient were used.

## RESULTS

The final sample consisted of 36 male patients of (mean  $\pm$  s.d.) age  $48.33 \pm 9.34$  years (range 31-66 years), duration of illness  $24.39 \pm 9.46$  years (range 6-41 years), duration

of hospitalization  $16.5 \pm 7.80$  years (range 6-32 years) and age of onset  $23.94 \pm 4.19$  years (range 16-36 years).

Table-1 shows the stability of Positive and Negative symptoms using the ICC. All negative symptoms were extremely stable and had ICC's  $> 0.70$  ( $p < 0.0001$ ) except stereotyped thinking (ICC = 0.53,  $P < 0.0005$ ). Decreased spontaneity and flow of conversation (alogia) was the most stable symptom (ICC = 0.85,  $P < 0.0001$ ). The total negative syndrome score was very stable (ICC = 0.85,  $P < 0.0001$ ).

Table-2 shows the stability of the general psychopathology symptoms from the PANSS. There was marked variation in the stability of individual items. Disorientation (ICC = 0.77,  $p < 0.0001$ ) and poor attention (ICC = 0.75,  $p < 0.0001$ ) were very stable. An interesting finding was the moderate stability of items measuring motor and volitional disorders; Mannerisms and posturing (ICC = 0.53,  $p = 0.0003$ ), Motor retardation (ICC = 0.50,  $p = 0.0007$ ). Many symptoms were unstable over time.

Table -1 : Stability of Positive and Negative symptoms

Positive Symptoms	ICC	Significance	Negative Symptoms	ICC	Significance
Delusions	0.51	$p < 0.001$	Blunted affect	0.74	$p < 0.0001$
Conceptual Disorganization	0.29	$p < 0.05$	Emotional Withdrawal	0.81	$p < 0.0001$
Hallucinations	0.79	$p < 0.0001$	Poor rapport	0.78	$p < 0.0001$
Excitement	0.55	$p < 0.0005$	Passive Social Withdrawal	0.73	$p < 0.0001$
Grandiosity	0.23	N.S.	Impaired abstraction	0.78	$p < 0.0001$
Suspiciousness	-0.02	N.S.	Decreased Spontaneity and flow of conversation	0.85	$p < 0.0001$
Hostility	0.36	$p = 0.01$	Stereotyped thinking	0.53	$p < 0.0005$
Total Positive Score	0.58	$p = 0.0001$	Total negative Score	0.85	$p < 0.0001$

*df.* = (35,36),  $n = 36$

**Table-2 : Stability of PANSS General Psychopathology Symptoms**

Symptoms	ICC	Significance
Somatic concern	0.52	p < 0.0005
Anxiety	-0.03	N.S.
Guilt feelings	0.40	p = 0.007
Tension	0.33	p = 0.02
Mannerisms and Posturing	0.53	p = 0.0003
Depression	0.20	N.S.
Motor Retardation	0.62	p < 0.0001
Uncooperativeness	0.10	N.S.
Unusual thought content	0.27	p = 0.05
Disorientation	0.77	p < 0.0001
Poor attention	0.75	p < 0.0001
Lack of judgement & insight	0.25	p = 0.06
Disturbance of Volition	0.50	p = 0.0007
Poor impulse control	-0.07	N.S.
Preoccupation	0.59	p < 0.0001
Active social avoidance	-0.28	N.S.
Total Score	0.30	p < 0.05

*df.* = (35,36), *n* = 36

The composite scores showed excellent stability (ICC = 0.88,  $p < 0.0001$ ). Using the composite score 28 patients were classified as Negative Schizophrenia and 8 as Positive Schizophrenia during the first assessment. During the second assessment 30 patients were classified as Negative and 5 as Positive Schizophrenia (1 had a composite score of 0 and was omitted from the analysis). 32/35 patients showed no temporal change in their Positive or

Negative status ( $K = 0.72$ ,  $p < 0.0001$ ). The PANSS stringent classification into Positive, Negative, Mixed and Indeterminate subtypes also showed good stability ( $K_w = 0.54$ ,  $p < 0.0001$ ). The number of initial (final) patients in each subtype were Positive 5(2), Mixed 4(2), Indeterminate 8(13) and Negative 19(19).

**Table-3 : Intercorrelations between Positive/Negative syndromes and Demographic Variables**

	Total Negative Score	Total Positive Score
Age	0.12	0.18
Age of onset	-0.33*	0.13
Duration of illness	0.26	0.12
Duration of Hospitalization	0.13	0.26

\*  $p < 0.05$ , two tailed,  $n = 36$

The mean of the initial and final scores for each patient was used for these correlations (Pearson's *r*).

Table 3 shows the intercorrelation between the Positive/Negative syndromes and demographic variables using the mean of the initial and final score for each syndrome. A significant negative correlation was seen between the age of onset of the illness and the severity of the Negative syndrome ( $r = -0.33$ ,  $p < 0.05$ , two tailed).

## DISCUSSION

In the present study patients were assessed for positive symptoms, negative symptoms and general psychopathology by a single rater twice, with an interval of 9 months between the 2

assessments. The data from the first assessment were not analysed till the entire study had been completed, to avoid influencing the second assessment. Negative symptoms were found to be much more stable than positive symptoms. Alogia was the most stable of the negative symptoms and hallucinations were the most stable of the positive symptoms. Similar findings have been reported by Johnstone *et al.* (1986). They studied the stability of negative and positive features in 84 schizophrenic patients using the Krawiecka scale after an interval of 4 years. Affective flattening followed by alogia were the most stable symptoms. Hallucinations and delusions were next in order of stability. Their study as well as the present study were based on chronically hospitalized schizophrenic patients. Taken together these studies suggest that negative symptoms are extremely stable in these patients.

Pfohl & Winkour (1982) in a careful retrospective study of the case notes of 52 schizophrenic patients over a span of 35 years found that positive symptoms had a significantly earlier onset than negative symptoms, and tended to disappear over time. Negative symptoms were significantly more stable than positive symptoms. Once negative symptoms appeared they persisted over time.

Carpenter *et al.* (1988) have introduced the concept of 'deficit schizophrenia.' They suggest that the term 'deficit symptoms' be used to refer to negative symptoms which are persistent, enduring and not secondary to other factors. Wagman *et al.* (1987) compared the neuropsychological function of 15 deficit and 15 matched non-deficit schizophrenics. The deficit group performed more poorly on the general performance factor. These results were independent of the severity of either positive or negative symptoms at the time of testing.

Pogue-Geile and Harrow (1985) examined the longitudinal course of negative symp-

toms in 31 schizophrenic patients 2.5 and 5 years after discharge. Psychomotor retardation, flat affect, poverty of speech and the total negative symptom score showed a non significant decline in the group as a whole. When negative symptoms were categorized as absent or present a significant longitudinal association was seen between the presence or absence of negative symptoms at the first and second follow-ups.

Kay and Singh (1980) examined the stability of Positive and Negative syndromes in 62 schizophrenic patients, using a precursor of the PANSS scale. Patients were initially kept drug free. Positive syndromes ( $r = .83, p < 0.001$ ) and Negative syndromes ( $r = .78, p < 0.001$ ) were both very stable during the drug free period. After treatment with neuroleptics for 3-4 months, significant correlations were still present between the initial and final scores for positive syndromes ( $r = 0.37, p < 0.005$ ) and negative syndromes ( $r = 0.43, p < 0.001$ ). This study was based on acute and subacute schizophrenic patients. The stability of positive and negative syndromes in these patients even after treatment suggests that these syndromes reflect underlying differences in the disease process. The present study being based on chronic hospitalized schizophrenic patients is not strictly comparable with Kay and Singh's study. Negative syndromes were very stable ( $ICC = 0.85, p < 0.0001$ ) and positive syndrome were moderately stable ( $ICC = 0.58, p < 0.0001$ ) in the present study.

An interesting finding in the present study was that the composite scores ( $ICC = 0.88, p < 0.0001$ ) were more stable than the positive and negative syndrome scores. This suggests that in these patients positive and negative symptoms increased and decreased together. Rosen *et al.* (1984) studied positive and negative symptoms in 46 drug free schizophrenic patients. They found that positive and negative symptoms increased together during exacerb-

erations. Patients who did not respond to treatment had both more positive and more negative symptoms than drug responsive patients.

The subtypes of schizophrenia based on the composite score (Positive/Negative) proved to be very stable in the present study. 32/35 patients had the same subtype after a period of 9 months ( $K = 0.72, p < 0.0001$ ). The stringent method of subtyping patients into Positive, Negative, Mixed and Intermediate was less stable ( $Kw = 0.54, p < 0.0001$ ) than the simpler composite score method. Andreasen *et al.* (1990) have drawn attention to the pitfalls in subtyping patients based on criteria which depend on varying combinations of symptoms with arbitrary cut off points. A minor change in rating practice can change the subtype of a patient. This lack of stability may confound attempts to correlate these subtypes with biological variables.

In the present study, disorientation (ICC = 0.77) and poor attention (ICC = 0.75) were the most stable symptoms from the general psychopathology subscale ( $p < 0.0001$ ). Age and temporal disorientation have been reported in 25 percent of chronically hospitalized schizophrenic patients (Stevens *et al.*, 1978) and have been associated with other signs of cognitive impairment (Liddle and Crow, 1984). Attentional impairment is an important feature of schizophrenia and has been considered as a negative symptom by Andreasen (1983). An interesting finding was that all items measuring motor and volitional disorders were moderately stable; Mannerisms & posturing (ICC = 0.53,  $p = 0.0003$ ), Motor retardation (ICC = 0.62,  $p = 0.0001$ ) and Disturbance of volition (ICC = 0.50,  $p = 0.0007$ ). Recent work has drawn attention to the importance of these disorders in schizophrenia (McKenna *et al.*, 1991).

In the present study a negative correlation was seen between the age of onset of schizophrenia and the severity of the negative syndrome ( $r = -0.33, p < 0.05$ , two tailed).

Johnstone *et al.* (1989) reported an association between earlier age of onset and the severity of negative symptoms. Crow (1989) has incorporated earlier age of onset as a feature of the modified Type II syndrome. In the present study no correlation was found between the severity of the negative syndrome and the duration of hospitalization as would have been expected had the negative symptoms been secondary to institutionalization.

The present study confirms the stability of negative symptoms reported earlier in chronically hospitalized schizophrenic patients. Positive and Negative subtypes of schizophrenia based on the composite scores showed excellent stability. Many of the important positive symptoms did not show satisfactory stability. Further prospective studies of schizophrenic patients to study the long term stability and course of individual symptoms, positive and negative syndromes and subtypes of schizophrenia are warranted.

## REFERENCES

- American Psychiatric Association. (1987). *Diagnostic and Statistical Manual of mental disorders*. 3rd ed., revised. Washington, DC: APA.
- Andreasen, N.C. (1983). *The scale for the Assessment of Negative Symptoms (SANS)*. Iowa city: University of Iowa.
- Andreasen, N.C. (1984). *The scale for the Assessment of Positive symptoms (SAPS)*. Iowa City: University of Iowa.
- Andreasen, N.C. (1990). *Positive and Negative Symptoms: Historical and Conceptual Aspects*. In: Andreasen, N.C. (ed), *Schizophrenia: Positive and Negative Symptoms and Syndromes*. Modern Problems of Pharmacopsychiatry. Basel, Karger, vol 24, pp 1-42.
- Andreasen, N.C.; Flaum, M.; Swazye II; Tyrell, G. and Arndt, S. (1990). *Positive and Negative Symptoms in Schizophrenia: A critical reappraisal*. *Archives of General Psychiatry*, 47, 615-621.
- Bartko, J.J. and Carpenter, W.T. (1976). *On the Methods and theory of Reliability*. *Journal of Nervous and Mental Disease*, 163, 307-317.

Carpenter, W.T.; Heinrichs, D.W. and Wagman, A.M.I. (1988). Deficit and Nondéficit forms of Schizophrenia : The Concept. *American Journal of Psychiatry*, 145, 578-583.

Crow, T.J. (1989). A current view of the type II syndrome : Age of onset, Intellectual impairment and the meaning of structural changes in the brain. *British Journal of Psychiatry*, 155 (suppl 7), 15-20.

Johnstone, E.C.; Owens, D.G.C.; Frith, C.D. and Crow, T.J. (1986). The Relative Stability of Positive and Negative features in chronic schizophrenia. *British Journal of Psychiatry*, 150, 60-64.

Johnstone, E.C. (1989). The Assessment of Positive and Negative Features in Schizophrenia. *British Journal of Psychiatry*, 155, (suppl 7), 41-44.

Johnstone, E.C.; Owens, D.G.C.; Bydder, G.M.; Colter, N.; Crow, T.J. and Frith, C.D. (1989). The spectrum of structural brain changes in schizophrenia: Age of onset as a predictor of cognitive and clinical impairments and their correlates. *Psychological Medicine*, 19, 91-103.

Kay, S.R.; Fiszbein, A. and Opler, L.A. (1987). The Positive and Negative Syndrome Scale (PANSS) for schizophrenics. *Schizophrenia Bulletin*, 13, 261-276.

Kay, S.R.; Opler, L.A. and Lindenmayer, J.P. (1988). Reliability and Validity of the Positive and Negative Syndrome Scale for Schizophrenics. *Psychiatry Research*, 23, 99-110.

Kay, S.R. and Singh, M.M. (1989). The Positive Negative distinction in drug free schizophrenic patients: Stability, Response to Neuroleptics and Prognostic significance. *Archives of General Psychiatry*, 46, 711-718.

Liddle, P.F. and Crow, T.J. (1984). Age disorientation in chronic schizophrenia is associated with global intellectual impairment. *British Journal of Psychiatry*, 144, 193-195.

McKenna, P.J.; Lund, C.E.; Mortimer, A.M. and Biggins, C.A. (1991). Motor, Volitional and Behavioural Disorder in Schizophrenia 2: The Conflicts of Paradigms Hypothesis. *British Journal of Psychiatry*, 158, 328-336.

Opler, L.A.; Kay, S.R.; Rosado, V. and Lindenmayer, J.P. (1984). Positive and Negative Syndrome in Chronic Schizophrenic Inpatients. *Journal of Nervous and Mental Disease*, 172, 317-325.

Pfohl, B. and Winokur, G. (1982). The evolution of symptoms in Institutionalized Hebephrenic/Catatonic Schizophrenics. *British Journal of Psychiatry*, 141, 567-572.

Pogue Gelle, M.F. and Harrow, M. (1985). Negative Symptoms in Schizophrenia: Their longitudinal course and Prognostic Importance. *Schizophrenia Bulletin*, 11, 427-439.

Rosen, W.G.; Mohs, R.C.; Johns, C.A.; Small, N.S.; Kendler, K.S.; Horvath, T.B. and Davis, K.L. (1984). Positive and Negative Symptoms in Schizophrenia. *Psychiatry Research*, 13, 277-284.

Stevens, M.; Crow, T.J.; Bowman, M.J. and Coles, E.C. (1978). Age Disorientation in Schizophrenia - a constant prevalence of 25 percent in chronic mental hospital population. *British Journal of Psychiatry*, 133, 130-136.

Wagman, A.M.I.; Heinrichs, D.W. and Carpenter, W.R. (1987). Deficit and nondéficit forms of schizophrenia : Neuropsychological Evaluation. *Psychiatry Research*, 22, 319-330.