

Assessment of the Negative Symptoms in a Sample of Egyptian Schizophrenic Patients : Association with Poor Premorbid Social Functioning and Cognitive Impairment

M. R. A. Raslan

The objective of this work was the study of the relationship between premorbid functioning, some clinical and treatment variables and cognitive functions of the schizophrenic patients from one side and the severity of their negative symptoms on the other side.

Method: to achieve the objective, 63 Egyptian schizophrenic patients were recruited from Kasr El-Aini University Hospital Psychiatric Clinic. They were assessed by PSAS, WAIS, SANS, BPRS and full psychiatric examination.

The Results: revealed that the severity of the negative symptoms was not correlated with the duration of illness or the duration of neuroleptic medication, or duration of hospitalization or the number of hospital admissions or the number of ECT sessions received by the patients. It was correlated with the severity of premorbid social and scholastic maladjustment, cognitive deterioration and age of onset of schizophrenic illness.

Conclusion: Schizophrenia especially its fundamental negative symptoms may be a neurodevelopmental disorder that manifests itself during childhood and early adolescence by maladjustment and during the active phase of illness by negative symptoms and cognitive deterioration.

(Egypt.J.Psychiat., 2000, 23 : 9 -17).

INTRODUCTION

Schizophrenia is a heterogenous disorder characterized by a broad range of symptoms rarely found together in a single individual . Recently these symptoms have been classified into negative symptoms and positive symptoms. The negative symptoms include affective flattening, alogia (poverty of speech), avolition, anhedonia-asociality and attention impairment. The positive symptoms included delusions, hallucinations and disturbance in thinking and behavior. (Okasha, 1988).

M. R. A. Raslan, M.D. Assistant Professor of Psychiatry, Cairo Univesity.

The concept of this distinction can be traced to the writing of Hugling Jackson, the British neurologist who believed that some neurological symptoms arise from direct interference with psychological function through brain damage. Others come about indirectly by the release of functions in neighbouring normal part of the brain previously inhibited by the now damaged part. The former he called negative symptoms, the latter he called positive symptoms. (Crow, 1980, 1985; Andreasen, 1985; Okasha, 1988).

Negative symptoms are considered to be more fundamental than positive symptoms. They may have different biological basis whether structural or neurochemical in the heterogenous group of schizophrenic patients. (Opler et.al., 1984; Pearlson et.al., 1984).

During 1980s and 1990s the research for the association between negative symptoms in schizophrenia and every possible clinical and biological variable was done and it is still an important issue of research especially after the discovery of atypical neuroleptics. (Kelley et.al., 1999).

In 1980s, neuroradiological research using computerized tomography frequently reported an association between prominent negative symptoms and high rates of structural brain abnormalities namely ventricular enlargement and cortical atrophy. (Andreasen et.al., 1982).

Patients with prominent negative symptoms are supposed to have different neurochemical system abnormalities than patients with prominent positive symptoms. This is possibly behind the resistance of negative symptoms to typical neuroleptic medication and good response to recent atypical neuroleptic drugs. (Marder and Meibach, 1994).

Patients with prominent negative symptoms also tend to have impaired performance on neuropsychological testing using tests such as Wechsler Adult Intelligence Test (Rieder et.al., 1979 ; and Donnelly et.al., 1980). This could reflect the underlying structural cerebral damage in these patients. (Weinberger et.al, 1983).

Another important aspect of interest in relation to the development and pathogenesis of schizophrenia and especially its negative symptoms is the premorbid functioning. There are several reports of maladjustment of schizophrenic patients in different populations prior to their illness. However, there is no specific pattern of this maladjustment. (Cannon-Spoor et.al., 1982).

There are still a lot of factors that are claimed to play roles in the pathogenesis or persistence of the negative symptoms.

These include the severity of the psychotic activity at the time of assessment of the negative symptoms, the duration of the illness and the duration of the neuroleptic medication. All these variables may play roles in the expression or causation or persistence of the negative symptoms in addition to the possible neuropathological origin. (Carpenter et.al., 1988 ; Kelley et.al., 1999).

Aim of the work

The primary goal of this study was to identify the characteristics of schizophrenic patients that are most likely to be associated with prominent negative symptoms in a sample of Egyptian patients. These characteristics were supposed to be found in the premorbid functioning, clinical and treatment variables and cognitive function. The hypothesis was that negative symptoms are more likely to be associated with premorbid variables and cognitive deterioration rather than to the current clinical and treatment variables.

SUBJECTS AND METHODS

Sixty three schizophrenic patients were recruited in this study. They were Egyptian selected from Kasr El-Aini University outpatient psychiatric clinic. Oral consents were given from the patients and their relatives before inclusion in the study. They were selected according to the following criteria: a) Fulfilling DSM-IV diagnostic criteria for schizophrenia. b) Age between 18-35 years old. c) Good degree of cooperation. d) Both sexes were included. e) Absence of any possible clinical neurological disease. f) Patients were on their conventional typical neuroleptic drugs. Nobody was on atypical neuroleptic drug included in this study. The demographic data are described in details in the results.

The following was done to the all patients utilizing the information from the patients, their relatives and the available records and sheets.

Complete history taking and neuropsychiatric assessment according to the sheet of Kasr El-Aini University Hospital.

Diagnosis of schizophrenia was done by at least two senior psychiatrists. The age of onset was determined as the age of first prodromal symptoms appearance. Duration of neuroleptic medication was calculated by the summation of all periods of medication as reported by the patients and their families. A similar method was used to get the total number of ECT and the total period of hospitalization.

Brief Psychiatric Rating Scale (BPRS) was done to assess the total psychopathology at the time of examination. (Overall, 1962).

Wechsler Adult Intelligence Scale (Arabic Version), was done to assess the cognitive functions of the patients. It is a well standardized test, that is commonly used nowadays in the schizophrenia research for their neuropsychological assessment. Deterioration index (DI) is considered as an indicator for cognitive functions deterioration (Abd Elhamid, 1988).

Premorbid Social Adjustment Scale (PSAS). (Foerster et al, 1991). This is a scale that is commonly used nowadays to assess the functioning of psychotic patients before the onset of illness. It assesses five areas of adjustment, sociability, peer relations, scholastic performance, adaptation to school and interests. Each subject received a score for each item rated on a 7 point scale rang from 1 (excellent adaptation) to 7 (extremely poor adaptation). Each item was rated separately for childhood (5-11 years) and adolescence (12-16 years).

The summation of items of peer relations and sociability in both stages gave us the social score. The summation of scholastic performance and adaptation to school in both stages gave us the scholastic score.

Scale for the Assessment of Negative Symptoms (SANS). (Andreasen, 1982). This scale includes 24 items grouped into five global items namely affective blunting, alogia, avolition-apathy, anhedonia - asociality and attention impairment. These five separate global ratings were summated for a total score for negative symptoms.

Statistical analysis

Statistical analysis was done using an IBM- compatible computer programme STATISTICA for windows 97. Significance level of 0.05 was used throughout all statistical tests within the study.

Statistical analysis was done according to Ingelfing et al (1994) and knapp and Miller (1992).

RESULTS

1-Demographic and clinical features of the sample:

The total number of patients was 63 schizophrenic individuals. Forty patients (63.4%) were males and 33 (36.6%) were females. Their age ranged from 18 to 35 years old. The mean age was $28.2 (\pm 3.7)$ years. Educational level was variable. The mean years of education was 8.9 ± 3.4 years. With regards marital status 20 patients (31.7%) were married, while 43 patients (68.3%) were unmarried.

The mean age of onset was 19.4 ± 2.5 ranging from 16-27. As regards duration of illness, the mean was 8.8 ± 3.3 years with a range of 1-16 years.

Table 1
Descriptive Statistics of Scores of WAIS, PSAS and BPRS in the Total Sample

	Minimum score	Maximum score	Mean	SD
WAIS:				
Verbal IQ	69	111	89.9	11.2
Performance IQ	72	109	89.4	10.9
Full scale IQ	61	109	89.1	11.9
Deterioration index	0	33	15.8	10.0
PSAS:				
Total score	14	46	26.8	8.5
Childhood score	4	23	9.7	4.5
Adolescence score	9	20	17.0	5.3
Schoolastic score	6	20	12.1	3.8
Social score	4	20	10.6	3.9
SANS:				
Blunted affect	0	5	2.9	1.0
Alogia	0	5	2.7	1.3
Avolition	1	5	2.6	1.0
Anhedonia	1	5	2.6	1.1
Attention impairment	0	5	1.9	1.1
Total	2	25	12.8	5.1
BPRS:	27	48	36.8	6.3

Table 2
Results of Correlation Analysis (r-values) between Some
Clinical Variables and the Scores of SANS (n=63)

Clinical Variable	Blunted affect	Avolition	Anhedonia	Alogia	Attention impairment	Total
Age of onset	-0.37*	-0.39*	-0.45*	-0.49*	-0.36*	-0.47*
Duration of illness	0.10	0.02	0.03	0.05	0.05	0.02
Duration of medication	0.18	0.10	0.12	0.02	0.18	0.08
Duration of hospitalization	0.10	0.08	0.23	0.11	0.07	0.13
No of hospital admissions	0.13	0.08	0.04	0.02	0.06	0.06
No of ECT	0.11	0.12	0.13	0.10	0.10	0.12
BPRS total score	0.42*	0.48*	0.59*	0.38*	0.48*	0.52*

Critical value of r (n=63) at 0.05 level is ± 0.24 in a 2 tail test.

* Statistically significant

- ve sign indicates negative correlation.

Table 3
Results of Correlations Analysis (r-values) between
PSAS Scores and the Scores of SANS (n=63)

	Blunted affect	Avolition	Anhedonia	Alogia	Attention impairment	Total
Childhood score	0.51*	0.64*	0.63*	0.57*	0.66*	0.67*
Adolescence score	0.42*	0.71*	0.73*	0.68*	0.64*	0.71*
Social score	0.43*	0.64*	0.72*	0.61*	0.58*	0.67*
School score	0.45*	0.67*	0.70*	0.68*	0.65*	0.71*
Total score	0.53*	0.78*	0.80*	0.80*	0.75*	0.80*

Critical value of r (n=63) at 0.05 level is ± 0.24 in a 2 tail test.

* Statistically significant

Table 4
Results of Correlations Analysis (r values) Between
WAIS Results and the Scores of SANS. (n=63)

	Blunted affect	Avolition	Anhedonia	Alogia	Attention impairment	Total
Verbal IQ	-0.51*	-0.39*	-0.42*	-0.44*	-0.37*	-0.48*
Performance IQ	-0.35*	-0.28*	-0.44*	-0.23*	-0.36*	-0.37*
Full scale IQ	-0.45*	-0.40*	-0.54*	-0.43*	-0.44*	-0.50*
DI	-0.36*	-0.34*	-0.32*	-0.40*	-0.27*	-0.38*

Critical value of r (n=63) at 0.05 level is ± 0.24 in a 2 tail test.

* Statistically significant

- ve sign indicates negative correlation.

The patients were all on typical neuroleptic medication for years ranging between 1-13 years. The mean was 6.7 ± 2.8 years.

Most of schizophrenic patients within the sample were previously hospitalized for intermittent short periods. The mean number of admissions was 1.9 ± 1.2 . The mean duration of hospitalization was 1.2 ± 1.3 years.

They were all treated with ECT on several occasions. The total number of ECT for each patient was calculated. The mean was 19.3 ± 7.8 .

As regards subtypes according to DSMIV criteria, there were 15 patients (23.8%) of paranoid type, 34 patients (53.9%) undifferentiated type, 8 patients (12.7%) disorganized type, and 6 patients (9.5%) residual type.

2. Results of Wechsler intelligence test, Premorbid Social Adjustment Scale and Scale for Assessment of Negative Symptoms and Brief Psychiatric Rating Scale :

Table (1) shows the results of the sample in the term of the range and mean $\pm$ SD for each item in the three scales.

Also, WAIS results showed that 32 patients (51% had full scale IQ scores below average, and 31 patients (49%) had verbal scale IQ below average, and 34 (54%) had performance scale IQ scores below average.

Deterioration Index was between 15 and 30 in 23 patients (36%) and was above 30 in eleven patients (17%).

3. Correlative analysis :

Results of correlation analysis (*r* values) between basic clinical and medication variables of the patients and the total score of BPRS, and the items of SANS and its total score are shown in table (2). There was statistically significant negative correlation between the age of onset of schizophrenia and all items of SANS and its total score. There was also statistically significant positive correlation between the total score of BPRS and the items and total score of SANS. There was no evidence of significant correlation between duration of illness, duration of neuroleptic medication, number of hospital admissions, duration of hospitalization, and total number of ECT treatments and any of the items or total score of SANS.

Table (3) shows the results of the Correlations analysis (*r* values) between scores of Premorbid social adjustment scale (PSAS) and the items of SANS. There was statistically significant positive correlation between scores of PSAS and score of SANS and its total score.

Table (4) shows the correlation analysis (*r* values) between subscales of WAIS and items of SANS. There was statistically significant positive correlation between deterioration index and scores on all items of SANS. There was statistically significant negative correlation between verbal IQ, performance IQ and full scale IQ, and the scores on items of SANS.

4. Regression Analysis :

In order to identify the variables that influence the total scores of SANS (the index of severity of negative symptoms as a whole) directly from that variables that influence it indirectly (i-e, through its influence on other direct variable), multiple regression analysis was done.

The analysis showed that the total score of PSAS and the DI of WAIS have positive direct correlation with the total score of SANS. The other variables that are significantly correlated using univariate analysis (BPRS, age of onset, IQs) affect total score of SANS through the correlation with each other and the other direct variables. So they have only indirect influence on the total score of SANS.

DISCUSSION

The results of this study gave several findings. At first, the cognitive functions of the schizophrenic patients as reflected in the scores of all scales of WAIS and its deterioration index were less than that accepted for normal individuals as reported in Wechsler, (1958), and Okasha, (1990). This reflects the deficits in the intellectual abilities of the schizophrenic patients. This finding is in agreement with most of the investigators using the WAIS to test the cognitive functions of the schizophrenic patients. (Rieder et.al., 1979 ; Donnelly et.al., 1980 ; Andreasen, 1982 ; Opler et.al., 1984).

This poor performance of schizophrenic patients on WAIS may be attributed to the structural brain (still unknown) abnormalities. (Weinberger et.al., 1983 ; and Crow, 1985).

The second finding, in this study was the high scores of patients in PSAS, in all of its items reflecting poor adjustment during childhood and early adoles-

cence. It is noticed that poor adjustment was apparent in both childhood and adolescence periods and not only adolescence period which is an evidence against the hypothesis that poor scores on adjustment scales reflects only the early prodromal symptoms of schizophrenia. This result is in agreement with that of Cannon-Spoor, et.al. (1982), and Cannon et.al., (1997)

The third finding in this study was the absence of any correlation between the severity of negative symptoms and the supposed clinical variables namely the duration of illness, duration of neuroleptic medication, number of hospital admissions, length of hospitalization and the number of ECT sessions although the duration of illness. This indicates that negative symptoms do not develop with the chronicity of the illness. They are also not the effect of the prolonged use of the typical neuroleptics, or treatment with ECT or the long stay in the hospitals. This is against the hypotheses of Barton in 1959 and Wing in 1978 who claimed that the symptoms of impaired socialization, inattention, avolition and apathy are considered as "secondary handicap", that occur as result of the chronicity of the illness, ECT and prolonged treatment with neuroleptic drugs. (Jones, 1988). On the other hand, these findings may mean that prominent negative symptoms are not the factors that indicate more hospital admissions or prolonged stay in the hospital or more treatment with ECT.

The fourth and the most important finding in this work was the finding of direct strong positive correlation between the total score of PSAS, and the cognitive deterioration as detected by DI and the severity of negative symptoms. This led us to support the hypothesis that schizophrenia may be slowly progressive neurodevelopmental process that starts

early in life. In the childhood period the deficit predisposes the person (schizophrenic later on) to attentional difficulties, unusual thought processes and decreased socialization abilities. These deficits are behind the maladjustment in the school and social life before the onset of psychosis. When the speed of the neurodevelopmental disorder is accelerated at adolescence, the clinical syndrome of schizophrenia becomes overt and cognitive deficit starts to be more manifest and the negative symptoms become more prominent. This model is in agreement with the hypotheses and findings of Crow (1980, and 1985), Andreasen (1982, and 1985), and Cannon et.al. (1997). The question of how these longitudinal deficits and symptoms are expression of genetic, neurochemical and structural abnormalities are still not fully understood.

The neurodevelopmental model of schizophrenia and its relation to negative symptoms was best described by Bleuler (1911). He suggested that schizophrenia was due to brain disease. At some stages there were no pathological brain processes but only a mild quantitative deviation of brain function from the normal (in our study, this could explain the premorbid life maladjustment before the onset of actual psychosis). Primary symptoms were considered to be the most fundamental aspect of the schizophrenic process. They were the basis for the recent description of negative symptoms by Crow (1980) and Andreasen (1982).

This study gives some support to the revival of Bleulerian view and model of schizophrenia and encourages the research in the negative symptoms and cognitive deficits of schizophrenia considering them more significant and characteristic of the longitudinal march of the schizophrenia more than the transient changing positive symptoms.

REFERENCES

- Abd Elhamid, AA (1988) Assessment of organic deficits in geriatric psychoses. Unpublished MD thesis Cairo university, *Faculty of Medicine*
- American Psychiatric Association (1994) Diagnostic and Statistical Manual of Mental Disorders. 4th edition (DSMIV) Washington, D.C. *American Psychiatric Association*.
- Andreasen, N.C. (1983) The scale for the assessment of negative symptoms (SANS): The University of Iowa, Iowa city..
- Andreasen, N.C. (1985) Positive vs negative schizophrenia A critical evaluation. *Schizophrenia Bulletin*, 11 : 380-89.
- Andreasen, N.C. Olsen S.A. Dennert J.W. and Smith M.R. (1982) Ventricular enlargement in schizophrenia. Relationship to positive and negative symptoms. *Am.J Psychiatry*, 139 : 297-302.
- Bleuler, E. (1911) *Dementia praecox or the group of schizophrenia* (Zinkin L. Transl). N/R international University Press.
- Quoted from Okasha (1988).
- Cannon, M. Jones P. Gilvarry, C. Rifkin, B.A. McKenzie, K. Foerster, A. and Murray, R. (1997) Premorbid social functioning in schizophrenia and bipolar disorder : Similarities and Differences. *Am. J. Psychiatry*, 154 : 1544-50.
- Cannon-Spoor, E. Potkin, S. and Wyatt, R. (1982) Measurement of premorbid adjustment in chronic schizophrenia, *Schizophrenia Bulletin*, 8 : 470-84.
- Carpenter, W.T. Heinrichs, D. and Wagman, AM. (1988) Deficit and nondeficit forms of schizophrenia : The concept. *Am.J. psychiatry*, 145 : 578-82.
- Crow, T.J. (1980) Molecular pathology of schizophrenia : More than one disease process ? *Brit. J. Psychiatry*, 280 : 66-68.
- Crow, T.J. (1985) The two syndrome concept : Origins and current status. *Schizophrenia bulletin*, 11: 471-78.
- Donnelly, E.F. Weinberger, DR Woldman, IN. and Wyatt, RJ. (1980) Cognitive impairment associated with morphological brain abnormalities on computed tomography in chronic schizophrenic patients. *J. nervous and mental diseases*, 168: 305-308.
- Foerster, A. Lewis, S. Owen, M. and Murray, R. (1991) : Premorbid adjustment and personality in psychosis : effects of sex and diagnosis. *Brit J. Psychiatry*, 158: 171-76.
- Ingellinger, J.A. Mosteller, FM Thibondeou, LA. and Ware, J.H. (1994) *Biostatistics in Clinical Medicine*. McGraw-Hill Incorporation, New york.
- Jones, (1988) Social science in relation to psychiatry. In Kendel, R. and Zealley, A. (eds.). *Companion to psychiatric studies* 4th edition. Churchill Livingstone, London.
- Kelley, M. Vankammen, D. and Allen, D. (1999) Empirical validation of primary negative symptoms : Independence from effects of medication and psychosis. *Am. J. Psychiatry*, 166 : 406-11.
- Knapp, R.G. and Müller, M.C. (1992) *Clinical epidemiology and biostatics*. Harwal Publishing Company, Pennsylvania.
- Marder, S.R. and Mebach, R.C. (1994) Risperidone in the treatment of schizophrenia (1994) : *Am.J. Psychiatry*, 151 : 825-35.

تقويم الأعراض السلبية في عينة من مرضى الفصام المصريين: الارتباط بين الأعراض السلبية والأداء الاجتماعي في فترة ما قبل المرض والتدهور المعرفي

يهدف هذا البحث إلى دراسة العلاقة بين التكيف في مرحلة ما قبل المرض عند المرضى الفصاميين، وكذلك بعض المتغيرات الإكلينيكية والعلاجية وضعف الأداء المعرفي من ناحية وشدة الأعراض السلبية من جهة أخرى.

وقد أجرى هذا البحث على عينة من المرضى المترددين على العيادة الخارجية للقصر العيني بلغ عددهم ثلاثة وستين مريضاً.

وتمت الدراسة عن طريق إجراء الفحص الطبي النفسي الشامل مع إجراء اختبارات وكسلر لذكاء الراشدين ومقياس التكيف الاجتماعي لما قبل المرض ومقياس تقويم الأعراض السلبية ومقياس تقويم الأعراض النفسية المختصر.

أظهرت النتائج أن شدة الأعراض السلبية في مرضى الفصام ليس لها ارتباط بطول فترة المرض أو طول فترة العلاج بالأدوية المضادة للذهان أو طول فترة البقاء بالمستشفيات أو عدد مرات دخول المستشفيات أو عدد الصدمات الكهربائية التي تلقاها المريض طوال فترة علاجه.

كما أظهرت النتائج أيضاً أن الأعراض السلبية لها ارتباط واضح بالتدهور في الأداء الاجتماعي والدراسي في مرحلة ما قبل المرض وكذلك بضعف الأداء المعرفي، وكذلك بالسن عند بداية المرض.

كما توصل البحث إلى احتمال صحة نظرية أن مرض الفصام (أو على الأقل نوع منه) قد يكون نتاج اضطراب في النمو العصبي فيظهر بصورة غير واضحة في فترة الطفولة والمراهقة على هيئة التكيف الاجتماعي والدراسي ثم يظهر في صورة إكلينيكية واضحة على هيئة الأعراض السلبية وضعف الأداء المعرفي.