Clinical and Neurocognitive Correlates of Insight

Azzam H, Sayyah H, Eissa A

Department of Psychiatry, Ain Shams University, Cairo, Egypt.

ABSTRACT

Background: Insight has been identified as an important clinical outcome measure in schizophrenia, with nearly 60% of patients with schizophrenia evidencing moderate to severe unawareness of having a mental disorder. Explanations of the correlates and attributes of lack of insight are purely hypothetical and pending clarification. **Objective:** to examine the clinical and cognitive correlates of lack of insight in schizophrenia. **Subjects and methods:** A sample of 30 schizophrenic patients diagnosed with schizophrenia according to the DSM-IV. Positive and Negative Symptom Scale (PANSS) were applied to assess symptom severity; Scale of Unawareness of Mental Illness (SUMD); Schedule for the Assessment of Insight (SAI) and Beck Cognitive Insight Scale (BCIS) were used to assess clinical and cognitive insight. Wisconsin Card Sorting Test is used as a measure of executive functions and Wechsler Memory Scale is used to assess attention verbal and visual memory. **Results:** Visual memory was significantly correlated to awareness to mental disorder (p0.002), awareness to achieved effects of medications (p0.05), correct attribution of symptoms (p 0.027) as well as to global clinical insight assessed by the scale of assessment of insight (SAI) (p0.04).The only significant correlation between insight and WCST was that between the score and correct attribution of symptoms (p.0.027). No significant correlations between dimensions of psychopathology and any of the insight dimensions. **Conclusion:** Insight is a multidimensional phenomenon with some of its dimensions correlated to some cognitive functions but not to clinical variables of the disease.

Key words: Insight, Schizophrenia, Neurocognetive.

(Current Psychiatry 2009;16(1):102-11)

INTRODUCTION

Insight has been identified as an important clinical outcome measure in schizophrenia. Poor insight has been associated with treatment non adherence, poor prognosis and poor psychosocial functioning[1]. The DSM-IV field trials found that nearly 60% of the patients with schizophrenia evidenced moderate to severe unawareness of having a mental disorder. Insight into illness has been increasingly described as a multidimensional phenomenon.

Focus has primarily been on Clinical insights which refers to awareness of illness and treatment needs as well as correct attribution of symptoms[2]. In addition to attenuated clinical insight, patients with psychosis often have reduced capacity to reflect rationally on their anomalous experiences and to recognize that their conclusions are incorrect. Beck termed such insight *cognitive insight*. He summarized

the relevant components of this concept as "impairment of objectivity about the cognitive distortions, loss of ability to put these into perspective, resistance to corrective information from others and overconfidence in conclusions[3]. Explanations of the causes of lack of insight are purely hypothetical and pending clarification.

Psychological processes[1, 4], neurocognitive mechanisms[3] and psychopathological explanations[5] have been proposed as explanations for poor insight. In the past, poor insight in schizophrenia has been variously attributed to defensive denial, willful preference for psychosis, and personality style[1]. Presently, a consensus is emerging that some forms of poor insight in schizophrenia, reflect cognitive deficits which limit one's ability to grasp and create a coherent narrative about complex aspects of their disorders. Literature supporting this view includes observations that unawareness of illness appears to be similar to unawareness of neurological illness, sometimes called anosognosia which is linked to impairments in executive function, as well as studies linking awareness of illness, medication adherence, and executive function[3]. In other words, perhaps they are unaware they are ill because of difficulties making sense of and framing the enormous complexities posed by the dilemmas of schizophrenia[6]. Some studies showed that performance on tests of one domain of executive function, flexibility of abstract thought, predicts insight. It has been suggested, for instance, that people with schizophrenia who deny that they are ill perform more poorly relative to people with schizophrenia who acknowledge their condition on neurocognitive tests requiring them to produce novel and flexible solutions to complex problems. The evidence linking poor insight to impaired executive function suggests that poor insight may be related specifically to abnormalities of prefrontal cortex rather than abnormalities in other brain areas.

So the hypothesis this paper is testing through a cross sectional comparative study design is that insight in schizophrenia is correlated to cognitive dysfunction rather than nature and severity of symptoms. To rule out the possibility that any association between insight of disorder and neurocognition was the result merely of greater levels of symptoms, we also assessed four different domains of psychopathology.

Thus the aim of this study is to examine the clinical and cognitive correlates of lack of insight in schizophrenia.

SUBJECTS AND METHODS

A sample of 30 schizophrenic patients consecutively admitted to the Institute of Psychiatry Ain Shams University was enrolled in the study. Diagnosis of schizophrenia was established according to the DSM-IV. Exclusion criteria were history of fits, electroconvulsive therapy during the past six months, current substance abuse or organic brain syndrome.

Positive and Negative Symptom Scale (PANSS) to assess symptom severity Insight was assessed using 3 scales: Scale of Unawareness of Mental Illness (SUMD); Schedule for the Assessment of Insight (SAI) and Beck Cognitive Insight Scale (BCIS). Cognitive functions consist of IQ estimation using similarities and block design subtests of Wechsler Adult Intelligence scale (WAIS) followed by

Wechsler Memory Scale–Revised (WMS-R) and Wisconsin Card Sorting Test (WCST).

The Positive and Negative Syndrome Scale (PANSS)[7]**:** 17 is a 30-item rating scale semi structured interview, 7 items of which represent the positive symptoms, another 7 items are related to the negative symptoms, and the remaining 16 items cover related aspects of general psychopathology and functioning. The general psychopathology scale is purported to be an independent index of the overall severity of the patient's illness. Each item is rated on an interval scale ranging from 1 (absent) to 7 (extreme psychopathology). The total scores may thus range between 30-210, with a higher score indicative of a more severe illness.

The Scale to Assess Unawareness of Mental Disorder (SUMD)[8]: For the purposes of this study we used the central items of the SUMD: 1) awareness of mental disorder; 2) awareness of the consequences of mental disorder; and 3) awareness of the effects of treatment and 4) attribution of symptoms. Each of these items is rated on a five point scale, with 1 being complete awareness and 5 being severe unawareness.

Schedule for the Assessment of Insight (SAI)[2]: a semi-structured interview assessing three dimensions of insight: treatment adherence, awareness of illness and relabeling of psychotic phenomena the higher the scores the better the insight.

The Beck Cognitive Insight Scale (BCIS)[3]: was developed to evaluate patients' self-reflectiveness and their overconfidence in their interpretations of their experiences. A 15-item self-report questionnaire a 9-item self-reflectiveness subscale and a 6-item self-certainty subscale. The first component consisted of 9 items measuring objectivity, reflectiveness and openness to feedback and given the label self-reflectiveness. Under the umbrella of decision-making and resistance to feedback, 6 items were united in a second component of the scale, labeled self-certainty. High scores on the subscale self-reflectiveness and low scores on subscale self-certainty is considered as normal A composite index of the BCIS reflecting cognitive insight was calculated by subtracting the score for the self-certainty scale from that of the self-reflectiveness scale a score of 10 points or more signifies good cognitive insight. A battery for good insight included SCORE of 1 or 2 on the awareness subscale of SUMD; G12 1 or 2; a score of 7 or more on SAI; and a composite score of 10 or more on BCIS. According to this battery the sample is divided into a group of good insight and a group of poor insight.

Wechsler Memory Scale Revised (WMS-R): Is composed of five indices: general memory, verbal memory, visual memory, attention and concentration and delayed memory (recall). General memory scale was computed from a compound score of visual and verbal memory indices

Wisconson Card Sorting Test (WCST)[9]: The 64-card computerized version of the Wisconsin Card Sorting Test; was used as a measure of executive function or prefrontal cortex cognitive functions.

RESULTS

The mean age of the whole sample was 29.6, mean duration of illness in years 4.76, mean years of education 4 years. Mean scores for PANSS were as follows: PSS scale 22.2, NSS 22.8, GPS scale 34.9 PANSS total score 77.8. Mean score for awareness to illness 3.9 and awareness to

achieved effects of medication 3.awareness to the social consequences and attribution is 3.5.

Coming to the performance on cognitive functions mean score on similarities 9.9 and block design is 7.7. Mean scores for Wechsler Memory were as follows; general Wechsler memory 63.56, verb Wechsler memory 72.600, visual memory 68.06, Attention 67.40 and recall 60.3. WCST categories completed 5.36 WCST conceptual level 53.3 Score 47.8%.

Correlation between psychopathological dimensions measured by PANSS and clinical insight dimensions showed no significant correlation as seen in table (1). Correlation between psychopathological dimensions and clinical insight showed no significant correlation.

Awareness to mental illness was significantly correlated to visual memory while as score on WCST was significantly correlated to correct attribution of symptoms as being caused by mental illness as seen in table (2). Overall clinical insight assessment using SAI was negatively correlated to general memory and Visual memory as seen in table (3) which means that better insight is correlated with better general as well as visual memory as higher scores on SAI indicates lower level of insight.

Performance on visual attention was significantly correlated to awareness to illness, awareness to achieved effect of medication as well as to attribution. Total score on WCST was significantly correlated to attribution.

A significant negative correlation between SAI score (measuring global clinical insight on one side, general Wechsler memory subtest and visual memory.

Table 1: Correlation between psychopathological dimensions and clinical and cognitive insight

		Awareness of mental disorder	Awareness of achieved effects of meds	Social consequences	Attribution	SAI	Self Reference	Self certainty
P-S-S scale	Pearson Correlation	.084	-.025	.033	.050	-.045	.073	.025
	Sig. (2-tailed)	.660	.897	.862	.794	.813	.700	.897
	N	30	30	30	30	30	30	30
N-S-S scale	Pearson Correlation	-.091	-.043	.076	-.193	.189	-.240	.320
	Sig. (2-tailed)	.633	.822	.689	.307	.318	.201	.085
	N	30	30	30	30	30	30	30
GpS scale	Pearson Correlation	-.303	-.054	.061	-.202	.249	.268	-.116
	Sig. (2-tailed)	.103	.775	.747	.285	.184	.152	.541
	N	30	30	30	30	30	30	30
total panss	Pearson Correlation	-.200	-.144	-.044	-.237	.210	.066	.541
	Sig. (2-tailed)	.289	.447	.819	.208	.266	.728	30
	N	30	30	30	30	30	30	30

Table2: Correlation between cognitive functions SUMD subscales measuring clinical insight

	Awareness of mental disorder		Awareness of the achieved effects of meds		Awareness of the Social consequences		Attribution	
	r	P-value	r	P-value	r	P-value	r	p-value
General Wechsler memory	0.238	0.205	0.281	0.132	0.019	0.919	0.204	0.279
verbal memory	0.017	0.930	0.293	0.116	-0.149	0.433	0.087	0.646
visual memory	0.539	0.002*	0.362	0.050*	0.161	0.397	0.403	0.027*
Attention	0.148	0.436	0.234	0.213	0.117	0.538	0.165	0.385
recall	0.173	0.361	0.188	0.321	-0.046	0.811	0.147	0.439
WCST categories completed	0.217	0.249	0.213	0.259	0.199	0.292	0.246	0.190
WCST categories completed	0.224	0.234	0.185	0.327	-0.078	0.684	0.294	0.115
score	0.303	0.104	0.257	0.170	0.018	0.923	0.404	0.027*

Table3: Correlation between global clinical insight (measured by SAI), cognitive insight and cognitive functions

		SAI	S-Ref BCIS	S-Cert BCIS
General Wechsler memory	Pearson Correlation	-.324	.001	-.180
	Sig. (2-tailed)	.050 (*)	.995	.341
verbal memory	Pearson Correlation	-.312	.034	-.209
	Sig. (2-tailed)	.093	.860	.267
visual memory	Pearson Correlation	-.373(*)	-.137	-.160
	Sig. (2-tailed)	.043	.472	.397
Attention	Pearson Correlation	-.211	.169	-.068
	Sig. (2-tailed)	.262	.371	.721
recall	Pearson Correlation	-.067	.029	-.109
	Sig. (2-tailed)	.724	.881	.565
WCST categories completed	Pearson Correlation	-.067	-.136	-.006
	Sig. (2-tailed)	.725	.475	.975
WCST conceptual level	Pearson Correlation	-.304	-.053	.014
	Sig. (2-tailed)	.102	.779	.942
Score%	Pearson Correlation	-.297	-.079	-.085
	Sig. (2-tailed)	.110	.677	.655

Table 4: Comparison between patients with good insight and poor insight regarding dimensions of psychopathology

	INSIGHT	Mean	SD	**p**
P-S-S scale	Good	21.91	7.56	.279
	Poor	22.42	9.36	
N-S-S scale	Good	23.00	8.32	.342
	Poor	22.68	6.46	
GPS scale	Good	36.64	6.09	.160
	Poor	33.95	6.57	
total PANSS	Good	19.82		
	Poor	17.35		0.360

Table 5: Comparison between patients with good insight and poor insight regarding cognitive functions

	INSIGHT	Mean	SD	p
General memory	Good	58.384	14.84	0.605
	Poor	56.235	24.78	
Verbal memory	Good	101.230	14.78	0.675
	Poor	103.6471	14.08	
Visual memory	Good	119.230	17.57	0.093
	Poor	99.941	18.77	
attention	Good	95.461	13.09	0.955
	Poor	95.117	12.10	
Recall	Good	86.666	16.05	0.6147
	Poor	82.117	28.69	
WCST categ. comp	Good	6.74	2.53	.385
	Poor	3.00	11.57	
WCST con-level	Good	55.84	17.56	.233
	Poor	48.91	21.20	
Score%	Good	51.32	19.11	.937
	Poor	41.91	18.69	

Student t test to compare the group of good insight (n=13) to that of poor insight (n=17) to assess whether the two groups are matched showed no difference of statistical significance (p >0.05) regarding mean age, gender, years of education and mean duration of illness. There was no statistically significant difference between the two groups regarding severity of positive; negative; neither general psychopathology nor total PANSS scores as shown in table (4).

Comparison between patients with good insight and poor insight regarding cognitive functions showed no significant differences between the two groups regarding performance on Wechsler memory as well as on WCST however mean scores were better among the group of good insight as seen in table (5).

DISCUSSION

This study was trying to examine the relationship of clinical and cognitive insight to different symptom domains and cognitive functions in a sample of schizophrenic patients. The main findings of the current study can be summarized as follows: Some correlations did exist between clinical insight and certain cognitive functions. Visual memory was significantly correlated to awareness to mental disorder, awareness to achieved effects of medications, correct attribution of symptoms as well as to global clinical insight assessed by the scale of assessment of insight (SAI). The only significant correlation between insight and WCST was that between the score and correct attribution of symptoms. No significant correlations between dimensions of psychopathology and any of the insight dimensions.

Previous studies have attempted to link insight to cognitive deficits with mixed results. A number of studies have supported the concept that poor insight is associated with deficits in executive functioning in schizophrenia patients[10-16]. However, other studies have failed to find this relationship casting doubt on the conceptualization of poor insight as secondary to executive functioning deficits[17-20]. In a recent study the relationship between executive function and memory in the unaware and aware groups showed that the unaware group evidenced significantly more executive impairment (e.g. more preservative errors on the WCST) and a trend for more working memory impairment than the aware group[21]. In our study there was no significant difference between the group of good insight and that of poor insight regarding memory subscales and executive functions assessed by WCST yet mean scores (of memory and executive functions) of the group of good insight were generally higher than those of the group of poor insight. In our study the two groups were also matched regarding clinical and illness variables which controls the possibility that difference in performance might be a result of differences in clinical variables particularly greater symptom severity, type of symptoms and duration of illness.

In our study correct attribution of symptoms was significantly correlated to WCST score however we failed to find a correlation other WCST items and other clinical or cognitive insight. Young et al., found that deficient insight among schizophrenics (n=108) was significantly associated with worse WCST and decreased IQ[16]. The inverse relationship between insight and poor performance on the WCST has also been found in other research[13, 15]. Other studies have not found a relationship between the WCST and insight[13,17, 18, 20, 22]. A possible interpretation to the contradicting results may lie in methodological issues in the study design as some studies were performed during acute exacerbations and others during remission phases, duration of illness, differing severity of psychopathology as well as mean IQ or general cognitive abilities.

The relationship between insight and cognitive functions involves a number of other factors for instance, there is no relationship between poor insight and cognitive functioning at hospital admission, but there is a correlation between these variables at discharge. It was proposed that the degree of psychopathology during the acute stages of illness may obscure the relationship between insight and cognitive functioning[23]. Also, studies that have found a relationship between insight and cognitive functioning usually draw their results from participant pools that are older and more chronic than the participants in those studies with negative results[23]. Similarly, studies which did not find a link between neuropsychological impairment and insight involved participants who had a shorter mean duration of illness (less than 9 years) and appeared to be less ill when compared to those in the studies which did find a connection[17]. Our sample consists of acutely admitted patients with a mean duration of illness 4.76 Years which might explain the differences in results.

Insight–cognitive association seems to vary little with the severity of symptoms. From the 13 studies examining this relationship with the sample exclusively in patients 8 studies (62%) had significant association between cognition and insight. In the 12 studies that investigated the relation of insight and cognition among outpatients, 6 studies (50%) showed significant association[24]. while there was no significant correlation between BPRS total score and insight[13]. Our study demonstrated that insight was not correlated to the total score for PANSS. The sum of these findings suggests that insight is largely independent of global severity of psychopathology[25]. The relationship between neurocognition and insight might be nonlinear and involve a complex interplay with different factors[26].

Some previous studies have focused on the relation between more specific symptom dimensions and insight. Interest has been focused on the relationship between insight and the positive symptoms of schizophrenia. The majority of investigations have found significant, moderate inverse relationships between insight and positive symptoms[1, 17, 27]. Yet some have failed to find such a relationship[22] and arguments have been made that any relationship between the two is spurious[22, 28]. In our study there was no correlation between insight and positive symptoms. In addition insight levels remained constant while positive symptomatology improved and the autit was concluded that the mechanisms responsible for insight and positive symptoms were independent[28].

In our study negative symptoms tended to be correlated to self certainty but there was no other correlation with other insight dimensions. Amador and Kronegold, argued that a relationship does exist between negative symptoms and insight[6]. They hypothesize that lack of insight results from an inability to experience emotion, and that this inability to experience emotion arises, at least in part, from neuropsychological deficits associated with the deficit syndrome which is in line with our finding.

Several reports discussed that increased emotional withdrawal was negatively correlated with insight[18]. Also poor insight was associated with increased negative symptoms[27]. A small, but significant, inverse correlation between negative symptoms and insight (r=-.38). However, further analysis of THIS data via multiple regressions indicated that negative

symptoms alone did not contribute to the prediction of insight[17]. Other research has failed to find a relationship between negative symptoms and insight in psychotic patients[22, 25, 29].

CONCLUSION

Insight is a multidimensional phenomenon with some of its dimensions correlated to some cognitive functions but not to clinical variables of the disease.

RECOMMENDATIONS

In schizophrenics with impaired insight suspect and screen for cognitive dysfunction as it is more likely to co exist. The effect of therapies improving cognitive dysfunctions on insight in schizophrenia is an area for future studies that might have usefull clinical implications through improving insight.

REFERENCES

1. Amador XF, Flaum M, Andreasen NC et al. Awareness of illness in schizophrenia and schizoaffective and mood disorders. Arch Gen Psychiatry 1994;51:826.36
2. David AS. Insight and psychosis. British J Psych 1990;156:798-808.
3. Beck AT, Baruch E, Balter JM et al. A new instrument for measuring insight: the Beck Cognitive Insight Scale. Schizophr Res 2004;68:319–29.
4. Amador XF, and Paul-Odouard R. Defending the unabomber: anosognosia in schizophrenia. Psychiatr 2000;71:363–371.
5. Amador XF, Strauss DH, Yale SA et al. Awareness of Illness in schizophrenia Schizophrenic Bullitin 1991;17:113-32.
6. Amador XF, and Kronengold H. The description and meaning of insight. In X. F. Amador & A. S. David (Eds.) Insight and psychosis 1998;15-32. New York: Oxford University Press.
7. Kay SR, Fiszbein A, Opler LA The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophr Bull 1987;13:261-27.
8. Amador XF, Strauss DH, Scott A et al. Assessment of Insight in Psychosis. Am. J. Psychiatry 1993;150:873-79.
9. Kong SK, Thompson LL, Iverson GL et al. Winsconsin card sorting test-64 card version, Psychological assessment resources, Inc. 2000.
10. Drake R, and Lewis SW. Insight and neurocognition in schizophrenia. Schizophr. Res 2003;62:165–73.
11. Laroi F et al. Unawareness of illness in chronic schizophrenia and its relationship to structural brain measures and neuropsychological tests. Psychiatry Res. Neuroimaging 2000;100:49–58.
12. Rossell SL, Coakes J, Shapleske J et al. Insight: its relationship with cognitive function, brain volume, and symptoms in schizophrenia. Psychol. Med 2003;33(1):111–19.
13. McEvoy J, Hartman M, Gottlieb D et al. Common sense, insight and neuropsychological test performance in schizophrenia patients. Schizophr. Bull 1996;22:635-41.
14. Smith TE, Hull JM, Israel LM et al. Insight, symptoms and neurocognitive functioning in schizophrenia and schizoaffective disorder. Schizophr. Bull 2000;26:193-200.
15. Voruganti L, Heslegrave RJ, Awad AG. Neurocognitive correlates of positive and negative syndromes in schizophrenia.Can. J. Psychiatry 1997;42:1066-71.
16. Young DA, Zakzanis KK, Bailey C. Further parameters of insight and neuropsychological deficit in schizophrenia and other chronic mental diseases. J Nerv Ment Disord 1998;186:44–50.
17. Collins AA, Remington GJ, Coulter K et al. Insight, neurocognitive function & symptom clusters in chronic schizophrenia. Schizophrenia Res 1997;27:37-44.
18. Dickerson FB, Boronow JJ, RingelN et al. Lack of insight among outpatients with schizophrenia. Psychiatric Serv 1997;48:195-99.
19. Goldberg RW, Green-Paden LD et al. Correlates of insight in serious mental illness. J. Nerv.Ment. Dis 2001;189:137–45.
20. Sanz M, Constable G, Lopez-Ibor I et al. A comparative study of insight scales and their relationship to psychopathological and clinical variables. Psychol Med 1998;28:437–46.

21. Mysore A, Parks R, Lee K et al. Neurocognitive basis of insight in Schizophrenia. B. J. Psyc. 2007.
22. Cuesta MJ, and Peralta V. Lack of insight in schizophrenia. Schizophrenia Bull 1994;20:359-66.
23. Kemp R & David A. Psychological predictors of insight & Compliance in psychotic patients. B J Psych 1996;169:444-50.
24. Amador XF & David AS. Insight & psychosis. New York: Oxford University Press 1998.
25. David AS. The clinical importance of insight. In X. F. Amador & A. S. David (Eds.), Insight & psychosis 1998;332-51. New York: Oxford University Press.
26. Startup M. Insight and cognitive deficits in schizophrenia: evidence for a curvilinear relationship. Psychol. Med 1996;26:1277-81.
27. Kemp R, and Lambert T. Insight in schizophrenia and its relationship to psychopathology. Schizophrenia Res 1995;18:21-28.
28. McEvoy JP, Freter S, Everett G et al. Insight and the clinical outcome of schizophrenics. J Nervous Mental Disease 1989;177:48-51.
29. Almeida O, Howard R, Levy R et al. Insight and paranoid disorders of late life (late paraphrenia). Int J Geriatr Psychiatr 1996.

Address of Correspondence:

Azzam H. Lecturer of Psychiatry Department of psychiatry, Ain Shams University, Cairo, Egypt.

e-mail: *hananazzam98@yahoo.com*