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Relationship between insight into cognition, extrapyramidal symptoms and mental illness in schizophrenia

10.3109/00048674.2011.561483

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Schizophrenia patients commonly exhibit a general lack of insight. Importantly, there is evidence that deficits of insight are associated with non-compliance to treatment and poorer prognosis among schizophrenia patients [1]. Recent research has found that domains of insight such as subjective cognition and awareness of illness may be independent processes that are predicted by different factors [2,3]. In order to further explore these relationships, the present study examined the association between subjective cognition, awareness of illness, and a third domain, subjective extrapyramidal symptoms (EPS). Importantly, this is the first study of its kind to examine the relationships between these three insight domains.

A total of 81 patients were recruited from two psychiatric treatment centres. Patients aged 18-60 years and having a DSM-IV diagnosis of schizophrenia, schizoaffective disorder or schizophreniform disorder were included. In a naturalistic fashion, comorbid substance use disorder patients were not excluded. Patients presenting with a major physical disability and/or cognitive deficits of organic origin were excluded. All participants signed a detailed consent form. The study was approved by the local ethics committee.

Subjective cognition was assessed with the Subjective Scale to Investigate Cognition in Schizophrenia (SSTICS) [4]. Objective cognition was assessed using motor screening, paired associates learning (total errors and total trials) and spatial working memory (total errors and strategy) tests of the Cambridge Neuropsychological Test Automated Battery (CANTAB) [5]. Subjective and objective EPS were evaluated with the Extrapyramidal Symptoms Rating Scale (ESRS) [6]. Psychiatric symptoms were measured using the Positive and Negative Syndrome Scale (PANSS) [7]. Awareness of illness was measured using the insight subscore (G12) from the PANSS.

Statistical analyses were performed using the Predictive Analytics SoftWare (PASW; version 18). For all continuous variables, the Kolmogorov-Smirnov one-sample test for normality was applied. Root transformations

were used in order to remove skewness when appropriate. Multiple linear regression analyses were used to explore associations between subjective cognition, extrapyramidal symptoms and psychopathology, considering the influence of potential confounding factors. Analyses of variance and Pearson correlations were used to screen potential confounding factors (age, gender, education level, hospitalizations, psychiatric symptoms, comorbid SUD, anticholinergics and antipsychotic type). Confounds that were related with variables of interest ($p < 0.1$) were entered into the regression model.

The mean age, level of education and number of hospitalizations (SD) was 37.5 years (12) and 11.4 years (2.8) and 4.3 years (4.8), respectively. Of the patients 57 were men and 24 were women; 56 patients were diagnosed with schizophrenia, 22 with schizoaffective disorder and three with schizophreniform-disorder; 31 patients had a comorbid SUD (cannabis > alcohol > stimulants); 57 patients were treated with atypical antipsychotics, ten were treated with typicals, eight with a combination of both and five were drug-free; 14 patients required anticholinergics.

After adjustment for potential confounding factors, multiple regression analyses showed weak associations between SSTICS total score and subjective EPS ($\beta = 0.716$, SE = 0.379, $p = 0.063$; adjusted for education level) and between subjective EPS and PANSS insight ($\beta = -0.729$, SE = 0.35, $p = 0.041$; adjusted for age). However, there was no association between SSTICS total score and PANSS insight ($p > 0.1$). There were also strong associations between PANSS insight and PANSS positive symptoms ($\beta = 0.098$, SE = 0.026, $p = 0.0001$; adjusted for age) and between subjective EPS and Parkinsonism ($\beta = 0.911$, SE = 0.253, $p = 0.001$; adjusted for education level), akathisia ($\beta = 1.157$, SE = 0.202, $p = 0.0001$), but not dyskinesia ($p > 0.1$; adjusted for age). Dystonia was not present in significant amounts in our sample. There were no associations between the SSTICS total score and any cognitive variables (all $p > 0.1$), except for PAL total errors ($\beta = 1.333$, SE = 0.513, $p = 0.011$; adjusted for education level and SUD diagnosis).

The present study is the first of its kind to examine the relationship between subjective cognition, subjective EPS and awareness of illness. In accordance with a previous study by our group [8], we found no association between subjective cognition and awareness of illness, suggesting that these may be independent

processes. Moreover, both processes were weakly related to subjective EPS, which itself was strongly predicted by objective EPS. By contrast, subjective cognition was only weakly predicted by objective cognition, which mirrors previous results [9,10], suggesting that schizophrenia patients have poor insight into their cognitive deficits. Finally, we found a significant association between positive symptoms and unawareness of mental illness (as measured by PANSS G12). These data are in accordance with previous research which found associations between positive symptoms and dimensions on the Scale to Assess Unawareness of Mental Disorder [2].

A key limitation of the present study is the lack of a detailed scale to investigate awareness of mental illness in schizophrenia. Taken together, our results support the notion that the lack of insight in one domain does not necessarily result in lack of insight in another domain and that they may be controlled by at least partially separate mechanisms [2].

Acknowledgements

This trial was financed via an academic partnership between the Louis-H Lafontaine Foundation and Astra-Zeneca Pharmaceuticals and via a grant from the Fonds de la Recherche en Santé du Québec (FRSQ). E.S. is holder of the Eli Lilly Canada Chair of Schizophrenia

from the University of Montreal. S.P. is holder of a research scholarship from the FRSQ.

References

1. Buckley PF, Wirshing DA, Bhushan P, Pierre JM, Resnick SA, Wirshing WC. Lack of insight in schizophrenia: impact on treatment adherence. *CNS Drugs* 2007; 21:129–141.
2. Gilleen J, Greenwood K, David AS. Domains of awareness in schizophrenia. *Schizophr Bull* 2011; 37:61–72.
3. Kim JH, Byun HJ, Ann JH, Lee J. Relationship between subjective experiences and psychopathological dimensions in schizophrenia. *Aust N Z J Psychiatry* 2010; 44:952957.
4. Stip E, Caron J, Renaud S, Pampoulova T, Lecomte Y. Exploring cognitive complaints in schizophrenia: the subjective scale to investigate cognition in schizophrenia. *Compr Psychiatry* 2003; 44:331–340.
5. Elliott R, McKenna PJ, Robbins TW, Sahakian BJ. Specific neuropsychological deficits in schizophrenic patients with preserved intellectual function. *Cogn Neuropsychiatry* 1998; 3:45–70.
6. Chouinard G, Ross-Chouinard A, Annable L, Jones B. The extrapyramidal symptom rating scale. *Can J Neurol Sci* 1980; 7:233.
7. Kay SR, Fiszbein A, Opler LA. The positive and negative syndrome scale (PANSS) for schizophrenia. *Schizophr Bull* 1987; 13:261–276.
8. Lecardeur L, Briand C, Prouteau A, Lalonde P, Nicole L, Lesage A, Stip E. Preserved awareness of their cognitive deficits in patients with schizophrenia: convergent validity of the SSTICS. *Schizophr Res* 2009; 107:303–306.
9. Prouteau A, Verdoux H, Briand C, Lesage A, Lalonde P, Nicole L, Reinhartz D, Stip E. Self-assessed cognitive dysfunction and objective performance in outpatients with schizophrenia participating in a rehabilitation program. *Schizophr Res* 2004; 69:85–91.
10. Medalia A, Thysen J. Insight into neurocognitive dysfunction in schizophrenia. *Schizophr Bull* 2008; 34:1221–1230.