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Are schizophrenia and schizoaffective disorder neuropsychologically distinguishable?

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Abstract

This study sought to objectify the distinction between schizophrenia and schizoaffective disorder in terms of standard tasks measuring verbal and non-verbal cognitive ability, auditory working memory, verbal declarative memory and visual processing speed. Research participants included 103 outpatients with a diagnosis of schizophrenia, 48 with schizoaffective disorder, and 72 non-patients from the community. Schizophrenia patients were impaired on all cognitive measures relative to schizoaffective patients and non-psychiatric participants. Regression-based prediction models revealed that cognitive measures classified schizophrenia patients accurately (91%), but not patients with schizoaffective disorder (35%). In addition, there was no statistical evidence for the unique predictive validity of any specific cognitive task. Patients with schizophrenia were significantly more symptomatic and had greater community support requirements than those with schizoaffective disorder. However, group differences in cognitive performance are insufficient to separate these syndromes of psychotic illness.

Keywords: Schizoaffective disorder; Neuropsychology; Diagnosis

1. Introduction

Psychiatric nosology defines and distinguishes schizoaffective disorder from schizophrenia on the basis of a mood disturbance, which may occur in the presence of schizophrenic symptoms. Yet whether this clinical distinction also reflects a biological difference, or possibly a continuum, has been the subject of considerable debate (Kempf et al., 2005). Thus one view holds that patients with schizoaffective disorder have schizophrenia along with "incidental" mood-related symptoms. Another perspective is that schizophrenia and bipolar illness lie at opposite ends of a disease dimension, with schizoaffective disorder located roughly in the middle. Biological evidence in the form of genetic and population-based studies of the two conditions is limited and provides no definitive support for one view over another. However, recent reviews and theories propose that schizoaffective disorder is an intermediate condition with genetic links to both schizophrenia and bipolar illness (Hamshere et al.,

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2005; Laursen et al., 2005; Potash, 2006) or part of a single psychotic disorder that subsumes schizophrenia and the mood disorders (Lake and Hurwitz, 2006).

Part of the challenge in understanding the etiology and pathophysiology of schizophrenia-related disorders stems from the use of illness definitions that are grounded in symptoms and history. Hence there is a corresponding reliance on patient self-report and subjective data. It has been argued that greater definitional sophistication is required before advances in genetics and neurobiology can clarify syndromes like the psychoses (Gottesman and Gould, 2003; Kendell and Jablensky, 2003). A variety of biobehavioral and neurocognitive measures are available that may objectify and validate, or modify, prevailing illness definitions (Conklin and Iacono, 2003). Can these measures be used to improve the definitions of schizophrenia and schizoaffective disorder?

There is evidence that neurocognitive test performance may be useful in organizing psychiatric syndromes like the psychoses into more biologically homogeneous variants and subgroups (Heinrichs, 2005). For example, schizophrenia patients with and without generalized cognitive impairment have distinct genetic profiles (Hallmayer et al., 2005). Similarly, cognitive performance may distinguish schizophrenia from schizoaffective disorder if the diagnostic categories map onto different neurobiological entities. In support of this idea, Stip et al. (2005) reported significant differences between schizophrenia and schizoaffective patients on computerized measures of visuomotor speed and non-verbal memory. Furthermore, Gruber et al. (2006) demonstrated preserved auditory working memory in schizoaffective disorder relative to schizophrenia patients. These results conflict with earlier findings of no group differences on an extensive set of neurocognitive measures (Evans et al., 1999). Not surprisingly, lack of differentiation is interpreted as support for the view that schizoaffective disorder is a subtype of schizophrenia and not a distinct entity. However, unlike the more recent studies, Evans et al. evaluated middle-aged and elderly patients and included a substantial number not receiving anti-psychotic medication. These characteristics imply that patient samples generating negative findings may be unrepresentative of the schizophrenia population.

It is unknown whether different cognitive tasks vary in their sensitivity to diagnostic distinctions within the schizophrenia spectrum or all index the same broadly based dysfunction. Specific aspects of cognitive performance, including word recognition and vocabulary, resist many neurobiological disease processes and may therefore reflect premorbid abilities (Hawkins, 1998; Johnstone et al., 1995; Johnstone and Wilhelm, 1996). Hence it is noteworthy that Reichenberg et al. (2002) found schizophrenia and schizoaffective disorder patients to be statistically indistinguishable on intellectual and language measures of premorbid functioning. Nonetheless, their schizoaffective disorder sample was small, reducing statistical power and the ability to detect group differences. Accordingly, whether generalized or more selective impairments distinguish these syndromes of psychotic illness remains unclear.

The primary purpose of the present investigation was to determine if a set of commonly used neurocognitive measures yields performance differences in patients with schizophrenia compared to those with schizoaffective disorder. It was expected that schizophrenia patients would be significantly impaired relative to patients with schizoaffective disorder and healthy people. However, unlike previous studies, we were concerned not only with detecting group differences, but also with the ability of cognitive performance to recapitulate and thereby to validate the two diagnostic categories. By itself, a statistically significant difference in cognition is weak validation because extensive overlap may still exist between groups. In addition, the relative sensitivity of putative premorbid as well as present-state and combined cognitive indicators was assessed.

2. Materials and methods

2.1. Participants

The clinical sample comprised 151 male and female patients who met the following criteria: 1) diagnosis of schizophrenia ($n=103$) or schizoaffective disorder ($n=48$) by DSM-IV criteria; 2) outpatient status; 3) age 18–65 years; 4) no history of serious neurological or endocrine disorder, including head trauma, epilepsy, Cushing's disease or thyroid disorder; 5) no concurrent DSM-IV [10] diagnosis of substance abuse; 6) no history of developmental disability; 7) minimum English reading level of grade 6; 8) willingness and ability to sign informed consent; and 9) normal or corrected vision. One hundred and forty-six patients were receiving antipsychotic medication and 5 patients were temporarily medication-free at the time of the study. Demographic and clinical characteristics are presented in Table 1. Non-psychiatric control participants ($N=72$) were screened for medical and psychiatric illness and history of drug abuse. All participants were paid for their time.

Patients were recruited at the Community Schizophrenia Service (CSS) of St. Joseph's Healthcare Hamilton, the Hamilton Program for Schizophrenia (HPS), the Toronto, Ontario branch of the Canadian