

Psychopathology and neuropsychological impairments in deficit and nondeficit schizophrenia of Chinese origin

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Abstract

Deficit schizophrenia is a relatively homogeneous subtype of patients which is considered helpful to explore the pathogenesis of schizophrenia. The aim of the present study was to reexamine the clinical characteristics of deficit ($n=30$) and nondeficit schizophrenia ($n=93$) in a Chinese sample and investigate the differences of neurocognitive function among the two subtypes of schizophrenia and the normal controls ($n=103$). Schizophrenia patients completed the Brief Psychiatric Rating Scale (BPRS), Scale for the Assessment of Negative Symptoms (SANS) and Scale for the Assessment of Positive Symptoms (SAPS). Additionally, all participants completed an abbreviated version of the Wechsler Adult Intelligence Scale (WAIS-RC) and a neuropsychological test battery examining the executive functions, visuospatial abilities and explicit memory related to the frontal, parietal, and temporal lobe functions. The deficit group received higher scores than the nondeficit group on the BPRS anergia factor and SANS affective flattening, alogia, avolition-apathy, anhedonia-asociality subscales, but not on the SAPS. Both two schizophrenia subgroups performed more poorly on the WAIS-RC and neuropsychological tests than the normal controls. Moreover, deficit patients performed worse than nondeficit patients on the prorated IQ, the Trail Making Test, Wisconsin Card Sorting test and Block Design test. The present study replicated symptom profiles in deficit vs. nondeficit schizophrenia in the Chinese sample. Furthermore, this study suggested that deficit schizophrenia is associated with frontal and parietal lobe impairment, and that temporal lobe dysfunction may be a common basis for cognitive impairment in schizophrenia as a whole. © 2006 Elsevier Ireland Ltd. All rights reserved.

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1. Introduction

Schizophrenia is characterized by marked clinical variance among patients in their symptoms, biological correlates, disease impact on function, and response to treatment. Present research has been hindered by extreme heterogeneity among patients (Maj, 1998; Tsuang et al.,

2000). As a result, researchers have systematically parsed the symptomatology of schizophrenia into more homogeneous diagnostic categories, such as paranoid and non-paranoid subtypes or positive and negative subtypes. Deficit schizophrenia, proposed by Carpenter and colleagues (1988), is defined as a putative schizophrenia subtype, in which the primary negative symptoms are enduring, trait-like features throughout periods of clinical stability. Further, the primary negative symptoms are not attributable to depression, anxiety, paranoia, or

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medication side effects. The validity of the deficit/nondeficit schizophrenia classification has been supported by many studies indicating marked differences regarding (1) clinical signs and symptoms, (2) course of illness, (3) etiological vulnerability factors, (4) biological correlates, and (5) treatment response (Kirkpatrick et al., 2001). Longitudinal studies have demonstrated that the deficit subtype is a highly stable form of schizophrenia (Amador et al., 1999; Tek et al., 2001). Moreover, comparative studies have shown that the deficit subtype differs from the traditionally defined negative subtype in concept, treatment response and underlying neuropsychological correlates (Kirkpatrick et al., 1989, 1993; Kopelowicz et al., 1997, 2000; Buchanan et al., 1998; Cohen and Docherty, 2004). Therefore, with respect to the exploration of the etiology and pathogenesis of schizophrenia, the implications of the deficit/nondeficit categorization are profound.

With regard to the clinical symptomatology, past studies from a number of countries consistently indicate that deficit patients have more severe anhedonia, less severe depression and anxiety, less suicidal ideation, less severe delusions and suspiciousness, and less substance abuse than nondeficit patients (Kirkpatrick and Buchanan, 1990; Kirkpatrick et al., 1996a, 1996b; Earnst and Kring, 1999; Subotnik et al., 2000; Tiryaki et al., 2003; Galderisi et al., 2002; Arango et al., 2004). Furthermore, deficit schizophrenia has been shown to be characterized by poor premorbid functioning coupled with poor social and occupational functioning and quality of life after the onset (Fenton and McGlashan, 1994; Kirkpatrick et al., 1996a,b; Tek et al., 2001). Studies in the literature support the validity of the deficit/nondeficit categorization and, moreover, facilitate the identification of a subgroup of patients who appear to exhibit consistent clinical characteristics across independent studies.

In addition to the differences in symptomatology, individuals with deficit schizophrenia exhibit more severe neurological impairments and subsequently greater neurocognitive impairment, which likely contribute to their poorer social functioning (Kirkpatrick et al., 2001). Additionally, neuropsychological studies indicate that deficit schizophrenia patients show a significantly different profile from nondeficit patients when examining the dysfunction of separate brain regions. More specifically, several studies have shown that deficit patients performed significantly worse than nondeficit patients on executive function measures related to frontal lobe functioning (Putnam and Harvey, 2000; Bryson et al., 2001; Galderisi et al., 2002). Further, studies have found abnormalities among deficit schizophrenia patients in the sequencing of complex motor acts, visual

attention/information processing tasks, and antisaccadic and eye tracking tasks, all of which are thought to derive from dysfunction in parietal and prefrontal areas (Thaker et al., 1989; Malaspina et al., 1994, 2002; Ross, 2000; Ross et al., 1996, 1997; Buchanan et al., 1997; Nkam et al., 2001). In contrast, when comparing the functioning of the temporal lobe between the two subgroups, most of above studies failed to find a significant difference.

To further verify the validity of the deficit/nondeficit categorization and better understand the differences between the two subtypes of schizophrenia, studies examining different geographical and racial samples should be conducted. In our previous work, we developed the Chinese version of the Schedule for the Deficit Syndrome (SDS, Kirkpatrick et al., 1989), the instrument used to classify deficit and nondeficit schizophrenia, and demonstrated that it had good reliability and validity (Wang et al., 2005). Therefore, it is valuable to compare Eastern and Western patients in their symptom profiles and brain functioning impairments on the basis of our reliability and validity research on the SDS-C. To date, there is a paucity of research examining the pathogenesis of deficit and nondeficit schizophrenia in mainland China. Thus, we attempt to use a convergence-of-evidence approach to investigate the symptoms and the underlying biological correlates of the deficit syndrome, including multiple measures such as psychopathological evaluation, neuropsychological assessments, neuroelectrophysiological assessment, and functional neuroanatomical imaging.

In the present study, we first examined the clinical characteristics and psychopathology of deficit and nondeficit schizophrenia in a Chinese sample. We hypothesized that the psychopathological characteristics of Chinese patients with the deficit syndrome would be consistent with the pattern that has emerged from past studies conducted in Western countries. Second, we compared the performances on the neuropsychological measures among the deficit, nondeficit and normal groups. We hypothesized that deficit patients would perform worse on the general ability measure and show a different cognitive function profile from the nondeficit sample, although both subgroups would show a poorer performance than the normal group. In particular, we hypothesized that neuropsychological indices of executive function and visuospatial abilities, which are related to frontal and parietal lobe functioning, would be more impaired in deficit schizophrenia than in nondeficit schizophrenia. However, the indices sensitive to temporal lobe dysfunction, such as the verbal and visual explicit memory measures, would be expected to show no significant differences between the two subtypes of schizophrenia.

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