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The psychiatric symptomatology of deficit schizophrenia: A meta-analysis

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ABSTRACT

A relatively large literature has emerged supporting the notion that the deficit syndrome reflects a distinct illness within schizophrenia. One topic that has received limited attention is how deficit schizophrenia differs from nondeficit schizophrenia in terms of psychiatric symptomatology. The present study conducted a meta-analysis of 47 published studies to compare deficit and nondeficit patients in severity of positive, disorganization, negative, mood and total psychiatric symptoms. The patient groups did not differ in terms of positive or total psychiatric symptoms but deficit patients showed less severe mood symptoms and slightly more severe disorganization symptoms. Not surprisingly, deficit patients had much more severe negative symptoms. These results are discussed in terms of the construct validity of the deficit syndrome and the larger heterogeneity of schizophrenia. Additionally, diagnostic issues regarding the deficit syndrome are considered.

1. Introduction

The negative syndrome is critical for understanding schizophrenia in that it is associated with poor premorbid functioning, is characterized by a host of neurocognitive, pathophysiological and functional (Buchanan et al., 1990; Cohen et al., 2007; Heckers et al., 1999; Horan and Blanchard, 2003; Kirkpatrick and Buchanan, 1990b; Strauss et al., in press; Tamminga et al., 1992; Tiryaki et al., 2003) maladies and is resistant to available treatments (Arango et al., 2004; Buchanan et al., 1998; Kirkpatrick et al., 2000a,b; Kopelowicz et al., 1997). Although there have been many negative symptom definitions over the last century (e.g., "type II schizophrenia"; Crow, 1985; Strauss et al., 1974, "Process" schizophrenia; Kantor et al., 1953; "negative schizophrenia"; Andreasen and Olsen; 1982a, also see Berrios 1985) the "deficit syndrome" reflects a methodological innovation over prior conceptualizations in that its diagnosis is based on an operational definition that can be assessed using a well-validated semi-structured interview (Carpenter et al., 1999; Carpenter et al., 1988; Kirkpatrick et al., 1989; Kirkpatrick et al., 2001). The deficit syndrome diagnosis is made based on the presence of negative symptoms that are enduring (i.e., occur > 1 year) and "primary" (i.e., not directly attributable to "secondary" sources such as depression, co-occurring substance abuse, intellectual disability, social isolation, paranoia, disorganization, etc). The question of whether the deficit syndrome reflects a coherent illness within schizophrenia has generally been supported in a large literature (as of February 2009 there were 205 peer-reviewed studies revealed from a combined PsycINFO/Medline search) examining differences in deficit versus nondeficit schizophrenia. In short, the deficit syndrome of schizophrenia appears to be a promising construct for understanding negative symptoms of schizophrenia and for understanding the heterogeneity of the disorder more generally.

Although the deficit syndrome, by definition, signifies a more severe illness state in some aspects, it has been proposed that individuals with deficit schizophrenia may show similar or even less severe psychiatric symptoms in other aspects (Carpenter et al., 1999; Carpenter et al., 1988; Kirkpatrick et al., 2001). Since deficit symptoms are allegedly not due to depression, disorganization, suspiciousness or other symptoms, deficit patients versus nondeficit patients may be similar or attenuated in severity of affective, positive or disorganized symptoms. A number of independent investigations have substantiated this claim in that deficit patients have shown

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less suspiciousness and depression (Kirkpatrick et al., 1996b; Kirkpatrick et al., 1994), less guilt, hostility and anxiety (Kirkpatrick et al., 1993), less severe positive symptoms (Buchanan et al., 1990; Buchanan et al., 1997) and less alcohol and substance abuse (Kirkpatrick et al., 1996a). Moreover, they have shown attenuated subjective responses to stress in laboratory emotion-induction procedures compared to non-deficit patients (Cohen and Docherty, 2004a; Cohen et al., 2003, but see also Earnst and Kring, 1999).

The claim of whether psychiatric symptoms are similar or different in deficit versus nondeficit schizophrenia is important for several reasons. First, examination of this issue may shed light on the pathophysiology of the disorder. For example, if delusions and hallucinations are less severe in deficit schizophrenia this might suggest that the neural substrata underlying these processes (e.g., limbic regions; Frith, 2005; Silbersweig et al., 1995) are less pertinent in deficit schizophrenia. Second, demonstrating that deficit schizophrenia is not simply a globally-more severe form of illness is important for evaluating the construct validity of the deficit syndrome. Studies documenting specific neurobiological, neurocognitive and other pathophysiological anomalies need to contend with the possibility that deficit schizophrenia is simply a more severe illness state as opposed to a distinct illness process. Documenting that the symptoms in deficit schizophrenia are different, but not simply more severe, will support the notion that the disorder reflects a coherent entity within schizophrenia. Third, the issue of how deficit symptoms co-occur with positive symptoms is potentially important for understanding schizophrenia heterogeneity more broadly. Early conceptualizations of the disorder postulated that there were two forms of schizophrenia – one characterized by chronic course, poor prognosis and negative symptoms and another characterized by variable course, better prognosis and positive symptoms (Crow, 1985; Kantor et al., 1953). While some early data supported the inverse relationship between negative and positive symptoms (Andreasen and Olsen, 1982b), future studies found that they were orthogonal in nature (e.g., Bilder et al., 1985; Buchanan and Carpenter, 1994; Liddle, 1987; Strauss, et al., 1974). Since negative symptoms are heterogeneous, it could be the case that, in antithesis to the core concept of the deficit syndrome (Carpenter et al., 1999; Carpenter et al., 1988; Kirkpatrick et al., 2001), deficit and positive symptoms are inversely correlated. As noted previously, a handful of independent studies have reported this (Buchanan et al., 1990; Buchanan et al., 1997). To address these issues, we conducted a meta-analysis of psychiatric symptoms in deficit versus non-deficit schizophrenia.

Several important issues regarding diagnostic reliability arise when evaluating any deficit syndrome literature. First, there are multiple methods of measuring the deficit syndrome that may not demarcate identical populations. The gold standard is the Schedule for Deficit Syndrome (SDS; Kirkpatrick et al., 1989), a semi-structured interview closely tied to the operational definition of the deficit syndrome. Translated versions of the SDS, with varying degrees of psychometric data available, also exist (Brazo et al., 2002; Dollfus et al., 2002; Tiryaki et al., 2003). Another approach, involving the Proxy for Deficit Syndrome, involves the use of symptom rating scales from the Brief Psychiatric Rating (Lukoff et al., 1986) or Positive and Negative Symptom Scales (Kay et al., 1987) to estimate two cardinal deficit symptoms – blunt affect and diminished emotional experience (Kirkpatrick et al., 1993). Although a number of studies support the use of the PDS (Goetz et al., 2007; Kirkpatrick et al., 1993), some concerns have been raised about its temporal stability and its external validity (Roy et al., 2001; Subotnik et al., 1998). Second, it is important to acknowledge the inherent ambiguity in evaluating whether negative symptoms are primary or secondary in origin, as primary designation is often made based, not on evidence of idiopathy, but rather the potency of competing secondary explanations (Flaum and Andreasen, 1995). Thus, training in diagnosing deficit schizophrenia is an important variable to consider when evaluating the results of a literature. In the present study, we address these concerns by paying special consideration to the type of diagnostic instrument used and the training procedure reported in the source article.

2. Experimental/materials and methods

2.1. Search strategy for the meta-analysis.

We conducted a combined MEDLINE and PsycINFO search for studies published between 1986 and August 2007 having the following terms: a word base of "schizo*" and "deficit syndrome" (yielding 235 entries). Our inclusion criteria included the following: 1) the article is written or translated in English (36 studies excluded), 2) the article is an empirical study that is published in a peer-reviewed journal (15 studies excluded), 3) the article employs human subjects (1 study excluded), 4) the article reports original data of symptoms sufficient to compute effect sizes (64 studies excluded), 5) the article employs a validated deficit syndrome measure (3 studies excluded) and 6) the article reports data on both deficit and nondeficit patients (69 studies excluded). We were able to estimate standard deviation values, when missing, using formulas from (Hurlburt, 1994). In all, 47 studies were included in the present meta-analyses (Amador et al., 1999; Arango et al., 2000; Brazo et al., 2002; Bryson et al., 1999; Bryson et al., 1998; Bryson et al., 2001; Buchanan et al., 1998; Buchanan et al., 1997; Cimmer et al., 2006; Cohen and Docherty, 2004a; Cohen and Docherty, 2004b; Cohen et al., 2003; Earnst and Kring, 1999; Fenton and McGlashan, 1994; Goff et al., 2004; Gonul et al., 2003; Gourevitch et al., 2004; Harris et al., 1991; Heckers et al., 1999; Hong et al., 2003; Horan and Blanchard, 2003; Kirkpatrick et al., 1996a; Kirkpatrick et al., 1996b; Kirkpatrick and Buchanan, 1990a; Kirkpatrick et al., 1993; Kirkpatrick et al., 2000a,b; Kirkpatrick et al., 1996c; Kopelowicz et al., 2000; Loas et al., 1996; Ludewig et al., 2003; Ludewig and Vollenweider, 2002; Malaspina et al., 2000; Messias and Kirkpatrick, 2001; Nakaya and Ohmori, 2006; Nkam et al., 2001; Ribeyre et al., 1994; Ross et al., 1996; Samson et al., 1995; Spalletta et al., 1997; Subotnik et al., 1998; Tamminga et al., 1992; Tateyama et al., 2003; Tek et al., 2001; Thibaut et al., 1998; Tiryaki et al., 2003; Vaiva et al., 2002; Wagman et al., 1987).

Psychiatric symptomatology was assessed using a broad range of validated self-report (e.g., Beck Depression Inventory; Beck et al., 1961; Chapman Anhedonia Scales; Chapman et al., 1976) and interview (e.g., Brief Psychiatric Rating Scale; Lukoff et al., 1986), Positive and Negative Symptom Scale (Kay et al., 1987) based instruments. Mood symptoms, defined in terms of