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Comparison of psychopathological dimensions between major depressive disorder and schizophrenia spectrum disorders focusing on language, affectivity and motor behavior

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ABSTRACT

This study tested whether patients with major depressive disorder (MDD) and schizophrenia spectrum disorders would differ in three dimensions of psychopathology (language, affectivity and motor behavior) as assessed by the Bern Psychopathology Scale (BPS) in a cohort of 58 patients with MDD and 146 patients with schizophrenia spectrum disorders. The overall estimation of severity of each of the three dimensions was rated on a seven-point Likert scale from severely inhibited to severely disinhibited. Here, more than half of the patients endorsed ratings that showed normal or mildly (dis-)inhibited behavior. At group level more pronounced negative ratings of affect were seen in MDD. Group comparisons of the severity ratings on language or motor behavior yielded no differences between schizophrenia spectrum disorders and MDD. At the individuals' levels, extreme ratings in the language and motor dimensions were more frequent in schizophrenia spectrum disorders and in the affectivity dimension more frequent in MDD. Shared psychopathological features could be seen across diagnoses, supporting a dimensional approach to psychopathology in endogenous psychoses. However, the groups differ in the severity of affect ratings as well as in the distribution of language, affectivity and motor ratings with more variance among the group of schizophrenia spectrum disorders.

1. Introduction

Schizophrenia is a severe mental illness affecting about one percent of the adult population in the US and worldwide (Regier et al., 1993). It has been hypothesized that the psychopathological symptoms of psychosis are strongly related to functional and structural abnormalities in brain circuitry (Heckers, 2015). Theoretical models suggest an imbalance in brain regions of functions such as language, affectivity or motor behavior (Fujiwara et al., 2007; Hubl et al., 2004; Walther et al., 2009a, 2009b). Still, the neurobiology of schizophrenia is widely unknown. One of the problems hindering progress in schizophrenia research is the fact that past psychopathological dimensions map only poorly on brain circuits (Heckers, 2011). In order to assess clinical symptoms of psychosis and categorize specific subgroups with behavioral alterations in the three dimensions of language, affectivity, and motor behavior, the Bern Psychopathology Scale (BPS) was established (Strik et al., 2010). Indeed, dysfunction in the language, affect and motor system has been reported in schizophrenia in the past. Alterations in brain structure and function within the language system (i.e. superior temporal lobe and the arcuate fasciculus) have been linked to auditory verbal hallucinations and formal thought disorder in schizophrenia patients (Horn et al., 2009; Hubl et al., 2004; Strik et al., 2008; van de Ven et al., 2005). In addition, alterations in the affect dimension have been described: paranoid anxiety and delusions were related to abnormalities in the limbic system (i.e. within the ventral striatum, the amygdala and connecting fibers) (Bracht et al., 2014a; Juckel et al., 2006; Naidu et al., 2014; Romaniuk et al., 2010; Stegmayer et al., 2014b). Finally, aberrant motor behavior has been repeatedly observed in schizophrenia (Koning et al., 2010; Northoff, 2002; Peralta et al., 2010; Walther and Strik, 2012; Whitty et al., 2009). Some of these motor abnormalities were linked to alterations in the motor system (i.e. within the supplementary motor area, the basal ganglia and connecting fibers) (Bracht et al., 2013; Dazzan et al., 2004; Scheuerecker et al., 2009; Stegmayer et al., 2014a; Thomann et al., 2009; Walther, 2015; Walther et al., 2011a, 2016). However, previous findings have been inconsistent or incomplete as most symptom driven

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Table 1
Demographic and clinical characteristics of participants.

		SSD (n=146)	MDD (n=58)
Gender (n)	**Male (%)**	77 (52.7)	31 (53.4)
	Female (%)	69 (47.3)	27 (46.6)
Age (years)	**Mean (S.D.)**	38.5 (11.1)*	44.8 (11.4)*
Duration of illness (years)	**Mean (S.D.)**	9.7 (9.6)**	5.4 (7.4)**
Number of episodes (n)	**Mean (S.D.)**	6.1 (5.7)	2.4 (1.8)
Chlorpromazine equivalents (mg)[a]	**Mean (S.D.)**	563.3 (441.8)	42.3 (116.3)
Schizophrenia subtype (n)	**Paranoid (%)**	88 (60.3)	–
	Disorganized (%)	15 (10.3)	–
	Catatonic (%)	14 (9.6)	–
	Residual (%)	1 (0.7)	–
	Undifferentiated (%)	1 (0.7)	–
	Schizophreniform (%)	25 (17.2)	–
	Schizoaffective (%)	1 (0.7)	–
	Unspecified (%)	1 (0.7)	–
Depression (n)	**With catatonic features**		4 (6.9)
	With melancholic features		21 (36.2)
	With atypical features		18 (31.0)
	With postpartum onset		0 (0.0)
	Single episode, mild/moderate (%)	–	23 (39.7)
	Single episode, severe without psychotic features (%)	–	6 (10.3)
	Single episode, severe with psychotic features (%)	–	5 (8.6)
	Recurrent, mild/moderate (%)	–	15 (25.9)
	Recurrent, severe without psychotic features (%)	–	7 (12.1)
	Recurrent, severe with psychotic features (%)	–	2 (3.4)
Drug type (n)	**Amisulpride (%)**	5 (3.4)	0 (0)
	Aripiprazole (%)	3 (2.1)	0 (0)
	Clozapine (%)	17 (11.6)	0 (0)
	Flupentixol (%)	1 (0.7)	0 (0)
	Haloperidol (%)	5 (3.4)	0 (0)
	Olanzapine (%)	17 (11.6)	3 (5.2)
	Quetiapine (%)	9 (6.2)	3 (5.2)
	Risperidone (%)	30 (20.5)	3 (5.2)
	Zuclopentixol (%)	1 (0.7)	0 (0)
	Mix of antipsychotic drugs (%)	35 (24.0)	0 (0)
	No antipsychotic drugs (%)	8 (5.5)	49 (84.5)

Abbreviations: SSD=schizophrenia spectrum disorders; MDD=major depressive disorder; S.D.=Standard Deviation.
* $p < 0.001$.
** $p=0.003$.
[a] Chlorpromazine equivalents (mg) were calculated according to the literature.

studies focused only on one sign or one dimension of psychopathology. Thus, a neurobiologically informed phenomenology should take the three system-specific psychosis dimensions into account.

Growing evidence suggests that schizophrenia and MDD share common pathophysiological features (Karpov et al., 2016; Klaassen et al., 2013; Owoeye et al., 2013; Schrijvers et al., 2008; Walther and Strik, 2012). Not only has depression been frequently observed in patients with schizophrenia, but unipolar depression may be accompanied by psychotic symptoms. Furthermore, MDD is similar to schizophrenia in clinical and neuropsychological characteristics, e.g. negative symptoms and anergic state (Rosen et al., 2012). Particularly patients with psychotic depression present similar ratings in the assessment of negative symptoms, neurological soft signs, motor abnormalities, executive functioning and quality of life (Hill et al., 2004; Owoeye et al., 2013). Therefore, MDD and schizophrenia spectrum disorders may share more features than previously assumed. Still, there are major differences between schizophrenia and MDD, such as diverging scores in positive symptoms, formal thought disorder (Kircher et al., 2014) and paranoid delusions (Rosen et al., 2012). Focusing on the three brain systems of interest, evidence suggests that MDD patients suffer from thought disorder such as rumination (Kuhn et al., 2012), affective dysregulation involving the limbic system (Graham et al., 2013), and may also experience psychomotor disturbances (agitation or retardation)(Schrijvers et al., 2008; Walther et al., 2012a). Moreover there is a substantial heterogeneity in symptom presentation in both disorders. Nonetheless, previous research suggests greater symptom heterogeneity in schizophrenia patients compared to patients with major depression, though there has been some inconsistency (Rink et al., 2016). However, the association of the three system-specific dimensions in MDD has not been investigated so far. Neither have these dimensions been compared between MDD and schizophrenia spectrum disorders.

We therefore aimed to assess global scores for each of the three symptom dimensions language, affectivity and motor behavior in schizophrenia as indicated by the BPS, comparing our findings to a cohort of patients suffering from major depression disorder. Our research focused on investigating the relationship between those two disorders, for phenomenological similarities can be observed in the clinical setting, as mentioned above. We hypothesized that both clinical groups would demonstrate alterations in all three dimensions, but that schizophrenia patients present alterations in the language and motor system more frequently than patients with MDD.

2. Method

2.1. Subjects

This study was conducted at the University Hospital of Psychiatry Bern, Switzerland and included a large sample of 146 patients with schizophrenia spectrum disorders without any prodromal states (77 men, 69 women) and a sample of 58 patients with major depressive disorder (31 men, 27 women). Diagnoses were given by board-certified psychiatrists according to DSM-IV criteria based on clinical interviews and thorough review of all available case files. Patients were classified