Sensation-seeking, social anhedonia, and impulsivity in substance use disorder patients with and without schizophrenia and in non-abusing schizophrenia patients

Simon Zhornitsky [a], Élie Rizkallah [a,b], Tania Pampoulova [a,b], Jean-Pierre Chiasson [b], Olivier Lipp [a], Emmanuel Stip [a], Stéphane Potvin [a,*]

[a] *Department of Psychiatry, Faculty of Medicine, University of Montreal, Montreal, Canada*
[b] *Clinique du Nouveau-Départ, Montreal, Canada*

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ABSTRACT

Substance use disorders (SUDs) are common in patients with schizophrenia and this comorbidity is associated with a poorer prognosis, relative to non-abusing patients. One hypothesis that has been advanced in the literature is that dual diagnosis (DD) patients may have a different personality profile than non-abusing schizophrenia patients. The present case-control study aimed to characterize levels of personality traits (sensation-seeking, social anhedonia, and impulsivity) in substance abuse/dependence patients with (DD group; $n=31$) and without schizophrenia (SUD group; $n=39$), relative to non-abusing schizophrenia patients (SCZ group; $n=23$), and healthy controls ($n=25$). Impulsivity was assessed using the Barratt Impulsivity Scale. Sensation-seeking was assessed using the Zuckerman Sensation Seeking Scale. Social anhedonia was assessed with the Chapman Social Anhedonia Scale. We found that sensation-seeking was significantly higher in DD and SUD, relative to SCZ patients. We found that social anhedonia was significantly elevated in DD and SCZ, relative to healthy controls. We found that impulsivity was significantly higher in DD, SCZ and SUD patients, compared to healthy controls. The results suggest that sensation-seeking is prominent in substance abuse/dependence (irrespective of schizophrenia), social anhedonia is prominent in schizophrenia (irrespective of substance abuse/dependence), and impulsivity is prominent in all three populations.

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1. Introduction

Schizophrenia is a severely disabling psychiatric disease whose treatment is complicated by a nearly 50% prevalence of substance use disorder (SUD) in the United States (Regier et al., 1990). In non-psychosis individuals, SUDs are associated with increased psychiatric symptoms (Mauri et al., 2007; Zhornitsky et al., 2010a). In schizophrenia patients, SUDs have a negative impact on the course of the pathology. Compared to non-abusing patients, dually diagnosed schizophrenia patients are more frequently hospitalized, non-compliant with treatment, suicidal, impulsive and violent, homeless and unemployed, and they have more legal and health problems (Mueser et al., 1998; Negrete, 2003). One hypothesis that has been advanced in the literature is that dual diagnosis (DD) patients may have a different personality profile than non-abusing schizophrenia patients (Labouvie et al.,

1990; Blanchard et al., 1999, 2000; Gregg et al., 2007). Previous studies have revealed that DD patients differ from their non-abusing counterparts on measures of sensation-seeking and impulsivity, but not social anhedonia (Kwapil, 1998; Gut-Fayand et al., 2001; Dervaux et al., 2001; Zuckerman, 1994, 2007). However, these studies suffered from two main limitations: they did not include a group of healthy controls and they did not include a group of non-psychosis SUD patients. The inclusion of these comparison groups may help us parcel the respective associations between schizophrenia, substance abuse/dependence and the aforementioned personality traits. This field of inquiry is important because personality trait measures may help tailor pharmacological and psychosocial intervention in these populations. For instance, there is evidence that atypical antipsychotics are beneficial for the treatment of alcoholism among Type B alcoholics—characterized by an early onset of drinking, greater severity of dependence and more impulsivity and psychiatric symptoms (Babor et al., 1992; for review, see Zhornitsky et al., 2010b). Similarly, Conrod et al. (2000) found differential improvement in SUD outcomes among non-psychosis women who were matched to treatment based on

levels of impulsivity, hopelessness, sensation-seeking, and anxiety-sensitivity.

In this context, the present case-control study aimed to characterize levels of personality traits (sensation-seeking, social anhedonia, and impulsivity) in substance abuse/dependence patients with and without schizophrenia, relative to non-abusing schizophrenia patients and healthy controls. Importantly, this is the first study to directly compare these traits in the four groups.

2. Methods

Four groups of participants were recruited, namely: (i) active substance abuse/dependence patients with schizophrenia-spectrum disorders (schizophrenia, schizoaffective disorder, schizophreniform disorder; DD group); (ii) non-psychosis substance abuse/dependence patients entering detoxification (SUD group—current abuse/dependence [last three months]); (iii) schizophrenia patients without comorbid substance abuse (SCZ group) and; (iv) healthy controls not abusing substances (HC group). Psychiatric and SUD diagnoses (abuse/dependence) were made by well-trained psychiatrists (OL, ES) and physicians (TP, JPC), and were all based on DSM-IV criteria. Patients were recruited by psychiatrists and a physician (OL, ES, TP) at the Louis-H Lafontaine Hospital, Montreal. Non-psychosis SUD patients were recruited by physicians (TP, JPC) at the Nouveau Depart Clinic, Montreal. Positive and Negative Syndrome Scale (PANSS) and Calgary Depression Scale for Schizophrenia (CDSS) interviews were made by one interviewer across the three patient groups (TP). Patients were recruited as part of complementary follow-up trials reported in Potvin et al. (2006), Rizkallah et al. (2010) and Zhornitsky et al. (2011). However, missing data and study drop-outs prevented us from analyzing the follow-up data for personality traits. Healthy controls were recruited from among students and staff of the Centre de recherche Fernand-Seguin and the University of Montreal. Urine drug screenings were using in conjunction with clinical interview to confirm SUD diagnoses. All participants signed a detailed consent form. The study was approved by the local ethics committee.

For the three patient groups, exclusion criteria were: (i) individuals already on clozapine or quetiapine; (ii) individuals hospitalized in a psychiatric unit; (iii) pregnancy; (iv) female subjects of childbearing potential or inadequate contraception; and (v) clinically meaningful unstable, renal, hepatic, cardiovascular, respiratory, cerebrovascular or other serious, progressive physical disease. For the HC group, exclusion criteria (ii), (iii), (iv), and (v) apply. Further, no HCs had a DSM-IV psychiatric diagnosis and none were treated with centrally-acting medications.

Psychiatric symptoms (DD, SCZ and SUD groups) were measured using the PANSS (Kay et al., 1987) and the Calgary Depression Scale for Schizophrenia (Addington et al., 1994). Impulsivity was assessed using the Barratt Impulsiveness Scale (BIS; a 34-item self-report; Patton et al., 1995). Sensation-seeking was assessed using the Zuckerman Sensation Seeking Scale (form V) (SSS-V; a 40-item self-report; Zuckerman et al., 1978; Loas et al., 2001). Social anhedonia was assessed with the Chapman Social Anhedonia Scale (CSAS; a 40-item self-report; Chapman et al., 1976).

Differences in socio-demographic variables and psychiatric symptoms between the DD, SCZ, SUD and HC groups were analyzed using one-way analyses of variance (ANOVA) with group as the independent variable. Differences in personality traits were analyzed using one-way analysis measures analysis of covariance (ANCOVA) with age as a covariate and group as the independent variable. Multiple comparisons were performed using the Bonferroni correction. Dichotomous variables were evaluated using Pearson's Chi-square test. The level of significance was set at $p < 0.05$. Statistical analyses were performed using the Predictive Analytics SoftWare (PASW; version 18).

3. Results

3.1. Socio-demographic variables",5,1,2> Socio-demographic variables

Analysis of socio-demographic variables showed that individuals in the DD group were significantly younger than those in the SCZ and healthy control group ($p = 0.005$); however, there were no significant differences in gender, hospitalizations, diagnosis, and antipsychotic or substance class (Table 1).

3.2. Psychiatric symptoms

PANSS positive scores were significantly higher among DD, relative to SUD patients ($p = 0.04$); however, the difference did not remain significant after controlling for age in the ANCOVA. PANSS negative scores were also significantly higher among DD, relative to SUD patients ($p < 0.0001$). PANSS general symptoms did not significantly differ between the groups ($p = 0.1$). CDSS scores were significantly higher among DD and SUD, compared to SCZ patients ($p = 0.001$).

3.3. Personality traits

Sensation-seeking total score was significantly higher in DD and SUD patients, compared to schizophrenia patients and significantly higher in SUD patients, compared to healthy controls ($p < 0.0001$; Table 1). Social anhedonia score was significantly higher in DD and SCZ patients, relative to healthy controls ($p = 0.005$; Table 1). Impulsivity total score was significantly elevated in DD, SCZ and SUD patients, relative to healthy controls ($p < 0.0001$; Table 1). The results did not change after adding age or gender as into the ANCOVA.

4. Discussion

In the present study, we found that sensation-seeking was significantly higher in DD and SUD, relative to SCZ patients. These findings are consistent with previous data showing associations between sensation-seeking and substance abuse/dependence, regardless of psychosis comorbidity (Ersche et al., 2010; Bizzarri et al., 2007, 2009; Dervaux et al., 2001, 2010a,b; Zuckerman, 1994, 2007). Consistent with previous literature, the largest difference between the groups was found for the Disinhibition subscale of the SSS-V (Dervaux et al., 2001, 2010a,b). Here, circular logic is likely at play since the Disinhibition subscale contains a number of items pertaining to drug-use and sex, which are likely to be elevated among patients with substance abuse/dependence. In addition, Bizzarri et al. (2007) showed that sensation-seeking was significantly elevated in bipolar patients with substance abuse/dependence and in non-psychosis substance abusers, relative to healthy controls. Intriguingly, non-abusing bipolar patients exhibited a level of sensation-seeking that was higher than healthy controls, but lower than the two substance abusing groups. Here, we found that SCZ patients had significantly lower scores in the boredom susceptibility subscale of sensation-seeking, relative to healthy controls. These data suggest that (i) substance abuse/dependence patients with and without schizophrenia are characterized by abnormally high sensation-seeking, and (ii) non-abusing schizophrenia patients are characterized by abnormally low sensation-seeking.

We found that social anhedonia was significantly elevated in DD and SCZ, relative to healthy controls. A number of previous studies have established a link between social anhedonia and schizotypal personality traits and the development of schizophrenia-spectrum disorders. Indeed, there is evidence that subjects with social anhedonia exhibited higher schizotypal scores for interpersonal, paranoid, disorganized, and cognitive/perceptual dimensions, relative to controls (Rey et al., 2009). Likewise, Kwapil (1998) reported that 24% of subjects with high social anhedonia were diagnosed with schizophrenia-spectrum disorders at the 10-year follow-up, relative to only 1% of controls. By contrast, Dervaux et al. (2001) did not find a difference in physical anhedonia between schizophrenia patients with and without substance abuse/dependence. Here, the addition of the SUD and HC group suggests that anhedonia may actually play a role in dually diagnosed schizophrenia patients, but