Impulsivity and sensation seeking in alcohol abusing patients with schizophrenia

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Objective: Some studies have found that high levels of impulsivity and sensation seeking, particularly disinhibition are associated with substance abuse in patients with schizophrenia, as in the general population. However, no study has assessed impulsivity and sensation seeking specifically in schizophrenia patients with alcohol abuse or dependence.

Materials and methods: We compared impulsivity and sensation seeking in a group of schizophrenia patients (DSM-III-R criteria) with lifetime alcohol abuse or dependence (n = 34) and in a group without lifetime substance abuse or dependence (n = 66). The patients were assessed using the composite international diagnostic interview (CIDI) for DSM-III-R disorders, the positive and negative syndrome scale (PANSS), the Barratt impulsivity scale (BIS), the Zuckerman seeking sensation scale (SSS), and the physical anhedonia scale (PAS). Results: The mean scores for impulsivity and sensation seeking were higher in the group with lifetime alcohol abuse or dependence than in the group without substance abuse or dependence (BIS: 63.4 ± 18.7 vs 51.3 ± 14.2 respectively, ANOVA: F = 11.12, p = 0.001; SSS: 17.6 ± 8.9 vs 13.5 ± 6.7 respectively, ANOVA: F = 7.45, p = 0.008). There was no significant difference between the two groups on PAS score. Conclusion: Increased impulsivity or sensation seeking may be a link between schizophrenia and alcohol abuse or dependence.

Keywords: schizophrenia, alcohol, dependence, abuse, impulsivity, sensation seeking, anhedonia

INTRODUCTION

The high prevalence of alcohol use disorders (AUD, i.e. alcohol abuse or dependence) among patients with schizophrenia is now well established: in the Koskinen et al. meta-analysis of 60 studies, the median current rate of AUD was 9.4% and median of lifetime AUD prevalence 20.6% (Koskinen et al., 2009). The high comorbidity of AUD and schizophrenia may be related to male gender, younger persons (Cantor-Graeae et al., 2001), availability of drugs (Dixon, 1999), increased vulnerability to the effects of alcohol in patients with schizophrenia (D’Souza et al., 2006; Krystal et al., 2006), or neurobiological factors (Chambers et al., 2001). The high prevalence of substance abuse in patients with schizophrenia has sometimes been interpreted as self-medication for negative symptoms, anhedonia, depression or neuroleptic side effects, but no convincing evidence supports this idea (Mueser et al., 1998; D’Souza et al., 2006).

In non-schizophrenic subjects, high levels of impulsivity (Evenden, 1999; Moeller et al., 2001; de Wit, 2009; Dick et al., 2010) and sensation seeking (Crawford et al., 2003; Dom et al., 2006a,b) have been found to be associated with AUD, but this has been little studied in patients with schizophrenia. We previously found that high levels of impulsivity and sensation seeking, particularly regarding the disinhibition dimension, were associated with substance abuse in patients with schizophrenia (Dervaux et al., 2001; Gut-Fayand et al., 2001). However, this was not specifically studied with regard to the different substances of abuse. Mueser et al. (1990) stressed the need to assess the abuse of specific classes of substances and analyze the data accordingly.

Liraud and Verdoux (2000) found that a lifetime history of alcohol misuse was independently associated with higher total scores on the sensation seeking scale (SSS), on the “experience-seeking” and “disinhibition” sub-scores of the SSS and on the ‘motor impulsivity’ subscale of the Barratt impulsivity scale (BIS) in subjects with psychotic and mood disorders. However, their study included a limited number of patients with schizophrenia (n = 24) and other non-affective psychotic disorders, delusional disorder, psychotic disorders (n = 21), and included few schizophrenia patients who engaged in alcohol abuse; they were not analyzed separately (Liraud and Verdoux, 2000).

To our knowledge, no study has assessed impulsivity and sensation seeking specifically in patients with schizophrenia and AUD. Our objective was to compare impulsivity, sensation seeking, and anhedonia in a sample of schizophrenia patients with and without lifetime alcohol abuse or dependence.

MATERIALS AND METHODS

All consecutive patients over 18 years with DSM-III-R criteria for schizophrenia or schizoaffective disorder treated in a psychiatric department in south suburbs of Paris during 2 years, were enrolled in the study. Inclusion criteria for participation in the study were age 18 years or older and willingness to provide consent to participate in the study.

The method is described elsewhere (Dervaux et al., 2006). Briefly, all subjects were assessed by a senior psychiatrist (Alain Dervaux) using the composite international diagnostic interview...
The patients with AUD had a higher mean number of hospitalizations than patients without AUD (20.9%) patients presented AUD within the 6 months prior to the study finally included 100 subjects including a first group of patients with AUD: mean age = 34.1 years, SD = 7.7; patients without substance abuse: mean = 31.5 years, SD = 11.2, ANCOVA F = 1.69, df = 1.93, p = 0.16). There were five significant differences between the two groups for age (patients with AUD: mean age = 34.1 years, SD = 7.7; patients without substance abuse: mean = 31.5 years, SD = 11.2, ANCOVA F = 1.69, df = 1.93, p = 0.16). Marital status (never married: patients with AUD: mean = 34.1 years, SD = 7.7; patients without substance abuse: mean = 31.5 years, SD = 11.2, ANCOVA F = 1.69, df = 1.93, p = 0.16). Level of education (completed high school: patients with AUD: mean = 34.1 years, SD = 7.7; patients without substance abuse: mean = 31.5 years, SD = 11.2, ANCOVA F = 1.69, df = 1.93, p = 0.16).
In line with previous studies, the absence of any link between physical anhedonia scores and cannabis use or AUD does not support the self-medication hypothesis of alcohol abuse in schizophrenia (Mueser et al., 1998; Dervaux et al., 2001; D’Souza et al., 2009).

There are some limitations to our study. First, the patients included are not necessarily representative of all patients with schizophrenia, although the exhaustive recruitment limits the selection bias. Secondly, as in any retrospective study, the prevalence of lifetime alcohol abuse may have been under-estimated. Denial or under-estimation of substance abuse is common in patients with schizophrenia. However, certain authors have stressed that structured interviews are more sensitive for the diagnosis of lifetime substance abuse in patients with schizophrenia than toxicity tests (Albanese et al., 1994). In addition, Hides et al. (2006) found that self-reports of substance use showed good reliability with drug screens in a subsample of a cohort of patients with recent-onset psychosis (Cohen’s kappa = 0.90). Finally, the limited size of this sub-group does not permit a definitive conclusion to be reached.

**CONCLUSIONS**

Increased impulsivity or sensation seeking may be a link between schizophrenia and alcohol abuse or dependence. However, the role of impulsivity or sensation seeking may not be specific to AUD. Further studies will be needed to fully understand the relationship, particularly the addition of risk factors, between alcohol abuse or dependence and schizophrenia.

### Table 1 | Impulsivity and sensation seeking score ratings in schizophrenia patients with lifetime AUD (alcohol abuse or dependence) or without substance abuse.

|                        | Patients with AUD (n=34) | Patients without substance abuse (n=66) | ANCOVA |
|------------------------|--------------------------|----------------------------------------|--------|
|                       |                          |                                        | F (df=1.95) | p (Age and gender adjusted) |
| Barratt impulsivity scale total score (mean ± SD) | 63.4 (18.7) | 51.3 (14.2) | 11.12 | 0.001 |
| BIS: Motor subscale (mean ± SD) | 19.1 (8.7) | 14.1 (7.1) | 8.25 | 0.005 |
| BIS: Cognitive subscale (mean ± SD) | 23.0 (7.1) | 19.4 (5.8) | 6.41 | 0.01 |
| BIS: Non-planning subscale (mean ± SD) | 21.2 (7.0) | 17.8 (6.2) | 5.30 | 0.02 |
| Zuckerman sensation seeking scale total score (mean ± SD) | 17.6 (5.9) | 13.5 (6.7) | 4.06 | 0.047 |
| SSS disinhibition subscale (mean ± SD) | 4.5 (2.2) | 3.0 (2.0) | 10.97 | 0.001 |
| SSS thrill and adventure subscale (mean ± SD) | 5.9 (2.7) | 4.3 (2.0) | 4.35 | 0.04 |
| SSS experience-seeking subscale (mean ± SD) | 4.2 (2.0) | 3.9 (2.1) | 0.17 | 0.68 |
| SSS boredom susceptibility subscale (mean ± SD) | 3.0 (1.5) | 2.2 (1.7) | 4.22 | 0.04 |
| Chapman physical anhedonia scores (mean ± SD) | 18.0 (6.8) | 18.2 (8.5) | 0.00 | 0.99 |

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