Research paper

Heterogeneity of emotional and interpersonal difficulties in alcohol-dependence: A cluster analytic approach

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ABSTRACT

Background: Emotional and interpersonal impairments have been largely reported in alcohol-dependence, and their role in its development and maintenance is widely established. However, earlier studies have exclusively focused on group comparisons between healthy controls and alcohol-dependent individuals, considering them as a homogeneous population. The variability of socio-emotional profiles in this disorder thus remains totally unexplored. The present study used a cluster analytic approach to explore the heterogeneity of affective and social disorders in alcohol-dependent individuals.
Methods: 296 recently-detoxified alcohol-dependent patients were first compared with 246 matched healthy controls regarding self-reported emotional (i.e. alexithymia) and social (i.e. interpersonal problems) difficulties. Then, a cluster analysis was performed, focusing on the alcohol-dependent sample, to explore the presence of differential patterns of socio-emotional deficits and their links with demographic, psychopathological and alcohol-related variables.
Results: The group comparison between alcohol-dependent individuals and controls clearly confirmed that emotional and interpersonal difficulties constitute a key factor in alcohol-dependence. However, the cluster analysis identified five subgroups of alcohol-dependent individuals, presenting distinct combinations of alexithymia and interpersonal problems ranging from a total absence of reported impairment to generalized socio-emotional difficulties.
Conclusions: Alcohol-dependent individuals should no more be considered as constituting a unitary group regarding their affective and interpersonal difficulties, but rather as a population encompassing a wide variety of socio-emotional profiles. Future experimental studies on emotional and social variables should thus go beyond mere group comparisons to explore this heterogeneity, and prevention programs proposing an individualized evaluation and rehabilitation of these deficits should be promoted.

1. Introduction

The deleterious long-term consequences of excessive alcohol consumption on brain and cognition have been documented for decades, and the development of neuroimaging and neuropsychological techniques has allowed to further establish that alcohol-dependence is primarily characterized by large-scale sub-cortical and cortical dysfunctions (Bühler and Mann, 2011), leading to reduced performances in a wide-range of perceptive, attentional, memory and executive abilities (Stavro et al., 2013). Besides these impairments in cerebral and cognitive functions, other lines of researches have revealed the intensity of the emotional and interpersonal disturbances presented by alcohol-dependent patients (ADP).

On the one hand, the difficulties presented by ADP in the processing of their own emotional signals have been largely established, particularly in studies describing increased alexithymia in this population (Haviland et al., 1988, 1994; Taylor et al., 1990; Cecero and Holmstrom, 1997). Alexithymia, initially conceptualized by Sifneos (1973), is a multi-dimensional construct encompassing three dimensions: (1) a reduced ability to describe and communicate one's own feelings; (2) a difficulty to identify and differentiate one's own emotions, notably on the basis of body signals; (3) an externally-oriented

thinking style characterized by poor fantasy and imagination. Several studies have described increased alexithymia in recently detoxified ADP (Taieb et al., 2002; Uzun et al., 2003 for review) and more than 50% of ADP can be considered as alexithymic (Evren et al., 2008). Despite ongoing controversies regarding the causal link between alcohol-dependence and alexithymia (Thorberg et al., 2009), the presence of alexithymic traits constitutes a stable personality factor among ADP (de Timary et al., 2008) and is related to increased expectations towards alcohol consumption (Thorberg et al., 2016), thus potentially favoring excessive alcohol use. As a whole, these difficulties to correctly identify, interpret and react to self-experienced emotional states stand as a major factor in alcohol-dependence, which might play a direct role in the development and persistence of uncontrolled alcohol use (Marlatt et al., 1975; Philippot et al., 1999).

On the other hand, difficulties in the identification and interpretation of others' social signals have also been documented, initially by measuring the ability to decode affective signals from others' face or voice (Kornreich et al., 2001; Monnot et al., 2002). These early studies, latterly complemented by works exploring various aspects of emotional interpretation (Donadon and Osório, 2014), have demonstrated that alcohol-dependence is related to an impaired ability in the decoding of others' emotions (D'Hondt et al., 2014). Recent studies have gone beyond these decoding deficits to explore social cognition in alcohol-dependence, identifying intense deficiencies in a large range of social abilities. ADP notably present: (1) maladaptive self-standards in interpersonal contexts, indexed by an overestimation of the interpersonal performance they have to present during social interactions to obtain the desired positive relational outcome (Maurage et al., 2013); (2) impaired empathic abilities, particularly regarding the emotional empathy subcomponent related to the ability to detect and experience others' emotional states in interpersonal situations (Maurage et al., 2011); (3) an inability to efficiently understand irony or humor in complex communicative situations (Amenta et al., 2013); (4) a deficient social-problem solving, i.e. a reduced ability to generate socially sensitive and practically effective answers to complicated social scenarios (Schmidt et al., 2016); (5) a reduced Theory of Mind, namely an impaired ability to infer mental states from others' social signals in order to predict their behaviors or actions (Maurage et al., 2016). The currently dominant proposal is thus that alcohol-dependence is related to a broad deficit in interpersonal stimuli processing, suggesting globally impaired social cognition (Uekermann and Daum, 2008; Thoma et al., 2013). These deficits initially observed in experimental tasks seem to have direct consequences in ADP's everyday life, as alcohol-dependence is related to reduced involvement in social groups and increased social isolation (Chou et al., 2011), weaker social networks (Thompson et al., 2010) and reduced satisfaction and intensity of real-life interactions (Levola et al., 2014). The importance of interpersonal problems in alcohol-dependence is even further illustrated by data showing that: (1) social network density after detoxification is a strong predictor of long-term abstinence (Kelly et al., 2012); (2) difficulties in social interactions is identified as a crucial relapse factor by recently detoxified patients themselves (Zywiak et al., 2003). In line with what has been described for emotional variables, interpersonal problems thus also constitute a key variable involved in the maintenance of alcohol-dependence.

However, despite the widely-established existence of emotional and interpersonal impairments in alcohol-dependence, and the presence of reliable arguments to propose that these deficits play a key role in the emergence and persistence of this disorder (Thoma et al., 2013; Donadon and Osório, 2014), two main limitations exist regarding earlier studies. First, emotional and social parameters have not been explored simultaneously. Second, previous studies have considered ADP as a unitary group. Indeed, nearly all previous works focusing on affective or social variables in ADP have been exclusively based on the comparison between alcohol-dependent and matched healthy control groups, the differences observed being unequivocally inter-

preted as reflecting global deficits related to alcohol-dependence. However, while socio-emotional impairments at the group level might reflect a coherent pattern of deficits in all ADP, the mere use of simple group comparisons might also have hidden differential profiles, some patients genuinely presenting strongly impaired socio-emotional abilities, while others would actually be unimpaired. The often quite small sample size presented by earlier studies did not allow an in-depth exploration of this possible variability across participants, casting doubts on the generalizability of the results. This proposal that the exclusive focus of earlier works on global group comparisons actually hid a massive heterogeneity across alcohol-dependent individuals is further reinforced by the fact that: (1) while, as underlined above, most studies have described impaired socio-emotional abilities in this population, some contradictory results have also been reported (see for example Donadon and Osório (2014) for a review of the inconsistent data reported for emotional decoding), suggesting an inter-individual variability in the alcohol-dependent population for emotional and interpersonal abilities, and particularly for alexithymia (e.g. Shishido et al., 2013; Thorberg et al., 2011); (2) strong variations have been reported in the general population and in other psychiatric states regarding these emotional and interpersonal functions (e.g., Rocca et al., 2016), clearly suggesting that a similar heterogeneity of socio-emotional profiles might be found in alcohol-dependence. In view of these arguments, it appears urgent to explore the presence and extent of this heterogeneity among ADP.

While no previous exploration has specifically explored this question, this proposal that previous studies might have veiled an important variability across ADP has been reinforced by a recent study exploring Theory of Mind in alcohol-dependence (Maurage et al., 2015). Indeed, these authors showed, using experimental tasks exploring social cognition, that while a strongly significant group effect was observed between ADP and matched controls (suggesting an intense Theory of Mind deficit in alcohol-dependence), less than half of the ADP actually presented a significant deficit when their performances were individually compared with the control group. These preliminary results thus suggest that an important variability might be present in alcohol-dependent populations, this variability usually being masked by the focus on group comparisons.

More globally, a strong complementary argument to underline the usefulness of exploring heterogeneity of socio-emotional factors in the alcohol-dependent population is offered by the numerous earlier typologies and classifications related to this pathological state, clearly underlining that alcohol-dependent patients are not a unitary group on a wide-range of variables. Indeed, starting from the early typology proposed by Jellinek (1960), which differentiated five types of risky alcohol consumers (mostly distinguished according to psychopharmacological factors like tolerance, craving and withdrawal symptoms), many researchers have determined subtypes of ADP. Each of these works focused on a specific combination of variables, encompassing family (e.g., familial alcoholism, childhood environment), demographic (e.g., gender, age, social status), alcohol-related (e.g., age of onset, consumption intensity), personality (e.g., dependent or borderline profiles), cognitive (e.g., impulsivity, intellectual level) or psychopathological (e.g., depression, psychopathy) factors. For example, Cloninger's (Cloninger et al., 1981) and Babor's (Babor et al., 1992) typologies proposed binary distinctions among ADP (Types I-II or A-B, respectively), mostly based on the age of onset, the presence of comorbid personality disorders and the intensity of behavioral control loss. Other classifications separated up to four subtypes (e.g., Del Boca and Hesselbrock, 1996; Lesch et al., 1988), by also taking into account cerebral consequences and depressive-anxious comorbidities. More recently, these classifications have been completed by biological ones, focusing on the determination of endophenotypes by means of combined genetic, neuroimaging and metabolic measures (e.g. Hines et al., 2005; Porjesz and Rangaswamy, 2007). This multimodal biological exploration of alcohol-dependence offers innovative perspectives but is