Psychiatry Research 240 (2016) 381–389

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Motivational drive and alprazolam misuse: A recipe for aggression?

Bonnie Albrecht [a], Petra K. Staiger [a,*], Kate Hall [a,b], Nicolas Kambouropoulos [a], David Best [c]

[a] School of Psychology, Deakin University, Geelong, Australia
[b] Youth Substance and Advocacy Service, Victoria, Australia
[c] Sheffield Hallam University, Sheffield, United Kingdom

ARTICLE INFO

Article history:
Received 27 May 2015
Received in revised form
27 February 2016
Accepted 15 April 2016
Available online 30 April 2016

Keywords:
Benzodiazepines
Aggressive behaviour
Reinforcement sensitivity theory

ABSTRACT

Benzodiazepine-related aggression has received insufficient research attention, in particular little is known about the motivational factors which may contribute to the development of this paradoxical response. The revised Reinforcement Sensitivity Theory provides a theoretical framework from which to understand the relevant underlying motivational processes. The current study aimed to identify the role of approach and avoidance motivational tendencies in the occurrence of benzodiazepine-related aggression. Data regarding benzodiazepine and other substance use, approach and avoidance motivation, and general and physical aggressive behaviour were collected via self-report questionnaires. Participants were a convenience sample ($n=204$) who reported using benzodiazepines in the previous year. Participants were primarily male (62.7%), aged 18–51 years old. Hierarchical multiple regressions indicated that general and physical aggression were predicted by alprazolam use and Drive, a facet of approach motivation. Overall, lower diazepam use significantly predicted higher levels of general aggression. However, when diazepam-preferring participants were examined in isolation of the larger sample (23.5% of sample), problematic (dependent) diazepam use was associated with greater aggression scores, as was dependence risk for alprazolam-preferring participants (39.7% of sample). The findings highlight the importance of motivational factors and benzodiazepine use patterns in understanding benzodiazepine-related aggression, with implications for violent offender rehabilitation.

1. Introduction

Benzodiazepines are commonly used to manage anxiety or agitated behaviour. However, for an estimated 1–20% of users, benzodiazepine use is followed by an aggressive response (Lader, 2011). The somewhat paradoxical nature of this response, coupled with the high medical, financial and personal costs associated with aggressive behaviour, suggests that changes to prescribing policies and regulatory strategies may be required to reduce the likelihood of benzodiazepine-related aggression. However, surprisingly little attention has been paid to understanding the psychological processes associated with benzodiazepine-related aggression. Controlled laboratory studies have demonstrated that alprazolam and diazepam use can result in an increased aggressive response in some participants (e.g., Bond and Silveira, 1993; Bond et al., 1995; Ben-Porath and Taylor, 2002; Wallace and Taylor, 2009). Animal studies suggest that concurrent alcohol use (de Almeida et al., 2010) and pre-existing aggressive tendencies (Ferrari et al., 1997; Weerts et al., 1992) may influence such benzodiazepine-related aggression. Yet, few human studies have examined potential contributory factors (i.e., dose, other substance use, psychological or intrapersonal factors, context; see Albrecht et al., 2014, for systematic review). Of note, irrespective of a long-standing proposal that intrapersonal factors are important in understanding this response (Lion et al., 1975; Hoaken and Stewart, 2003), only a handful of studies have investigated the role of various personality characteristics in benzodiazepine-related aggression (i.e., trait anxiety, hostility; Wilkinson, 1985; Cherek et al., 1990; Ben-Porath and Taylor, 2002; Dåderman et al., 2002). This limited research, and the absence of a clear theoretical framework with which to explore benzodiazepine-related aggression impacts on our ability to develop meaningful, and testable, hypotheses and intervention strategies. We argue that current models of approach and avoidance motivational tendencies may be able to inform our understanding of benzodiazepine-related aggression.

Motivational systems are theorised to underlie a number of human behaviours, including violent and aggressive behaviour. Gray's (1982) Reinforcement Sensitivity Theory and its recent revision (rRST; Gray and McNaughton, 2003) purports to explain behavioural output and emotional expression based on three separate but interacting motivational systems. The behavioural approach system (BAS) promotes movement towards incentives and

* Corresponding author.
E-mail address: petra.staiger@deakin.edu.au (P.K. Staiger).

http://dx.doi.org/10.1016/j.psychres.2016.04.040
0165-1781/

rewards, often involving goal-directed behaviour and impulsive action. The fight-flight-freeze system (FFFS) promotes fearful avoidance of a threat, and over-activation clinically presents as phobia or panic (Corr and Perkins, 2006). The behavioural inhibition system (BIS) promotes risk assessment and conflict resolution (Corr, 2008), and is stimulated by simultaneous and similar activation of the other two systems (Pickering and Corr, 2008). As discussed below, the independent and interactive effects of these motivational systems have informed our understanding of aggressive behaviour. It is therefore expected that the application of this theory to benzodiazepine-related aggression will provide meaningful insight into the response, and inform the development of targeted intervention strategies.

Aggression appears to involve a strong approach motivational component (i.e., BAS mediated action such as antagonism; Smits and Kuppens, 2005). That is, aggression may in part be the result of high levels of motivated action towards goals or rewards. Indeed, studies with university students have reported that high levels of BAS are associated with anger and aggressive behaviour (Harmon-Jones, 2003; Harmon-Jones and Peterson, 2008). However, theoretical understanding of approach motivation (BAS) suggests that it involves multiple aspects, including behavioural restraint, planning and goal-directed behaviour (Segarra et al., 2014). The use of a broad, unidimensional measure of BAS in the above studies fails to account for such complexity. Instead, greater specificity is afforded through the use of a multidimensional measure of approach motivation. The BIS/BAS scales (Carver and White, 1994) were designed to account for the dynamic and multifaceted nature of the BAS.

Empirical evidence suggests that Drive is the most important facet of BAS in our understanding of aggressive behaviour (e.g., Seibert et al., 2010). Drive (BAS-Dr) involves persistent goal pursuit and functional impulsivity; whilst Fun Seeking involves dysfunctional impulsivity, with minimal thought to consequences; and Reward Responsiveness involves positive energy and affect in response to reward cues (Tull et al., 2010). BAS-Dr has been positively associated with the experience of anger (Harmon-Jones, 2003; Smits and Kuppens, 2005; Cooper et al., 2008), anger arousal, displaced aggression, and the tendency not to suppress anger expression (Cooper et al., 2008). It has also been associated with self-reported physical aggression (Harmon-Jones, 2003), relational aggression (Miller et al., 2012), and laboratory proxies of aggressive behaviour (Seibert et al., 2010). In addition, Beaver et al. (2008) identified that with increasing BAS-Dr, neural structures and dopaminergic pathways are activated in a similar pattern to that observed in relation to both reward processing and aggression, providing some explanation as to why BAS-Dr is so important in understanding aggression. Further conceptual understanding of the link between BAS-Dr and aggressive behaviour is afforded through the concept of frustrative non-reward, which is experienced when the expected reward is higher than the actual reward (Corr, 2002). Indeed, although predominantly associated with the experience of positive affect (i.e., through goal attainment), BAS-Dr has also been associated with the experience of negative affect, especially sadness, frustration and anger, experienced in the context of blocked or challenged reward attainment (Carver, 2004). Such scenarios may influence an aggressive response. Following such theorising, aggression may be especially likely if the individual also experiences sensitivity to cues of punishment or threat (i.e., avoidance motivational tendencies). Essentially, aggressive behaviour may involve a facilitative interplay between appetitive and aversive motivational systems, where aggression is more likely when an individual with high BAS-Dr also experiences strong avoidance tendencies.

Such an interaction may be especially important in the understanding of benzodiazepine-related aggression. Evidence suggests that benzodiazepines selectively interfere with the conflict resolution system (BIS) by making approach behaviour more likely (Pickering and Corr, 2008). As part of its conflict resolution role, the BIS mediates cautious approach behaviour when it is considered necessary to approach a threat (Perkins et al., 2007). In an individual with strong approach motivation tendencies (i.e., BAS-Dr), BIS may become increasingly activated in the context of threat or frustration compared to FFFS (i.e., goal frustrations/threats may be more likely to be considered necessary to approach rather than avoid in order to attain the goal). When coupled with benzodiazepine use, which further disinhibits the BIS from promoting risk averse avoidance behaviour, aggressive behaviour may result. Indeed, BIS has been associated with reactive aggression (Miller et al., 2012), potentially reflecting the frustration response, and at extremely high levels of BIS activation, the related emotional disturbance may increase aggression risk (Hatfield and Dula, 2014). As yet no studies have attempted to explore these specific hypotheses in substance-related aggression, particularly benzodiazepine-related aggression. Such investigation of the rRST motivational systems and their interactive effects will provide further insight into this relationship, with implications for violent offender rehabilitation and the continued prescription of benzodiazepines.

1.1. The current study

The current study aims to test the hypothesis that BAS-Dr plays a role in predicting benzodiazepine-related aggression, but that the interaction between BAS-Dr and BIS accounts for greater variance. Due to their prevalent use within the sample, the current study will explicitly focus on diazepam and alprazolam in relation to both general aggressive behaviour (i.e., anger, hostility, verbal aggression) and specifically physical aggression. Data regarding the participants' substance use, mental health, and criminal history, and recent psychological functioning will also be explored. It is predicted that:

1. BAS-Dr, or the tendency to persistently pursue appetitive goals, will significantly predict benzodiazepine-related general and physical aggression.
2. BAS-Dr will moderate the relationship between BIS and aggressive outcomes. Specifically, it is predicted that the relationship between BIS and benzodiazepine-related aggressive behaviour will be stronger for individuals with high levels of BAS-Dr.

2. Method

2.1. Design and procedure

Participants were recruited via a purposeful sampling method, which utilised an online electronic questionnaire and paper based questionnaires located at health services. Online participants were recruited through electronic platforms (Facebook, Reddit), newspaper adverts, and paper flyers posted around the host university. Health service clients were recruited from a community based outpatient alcohol and drug treatment service and a residential alcohol and drug treatment facility via flyers or conversation with their treating clinician. Consent was implied by completion of the questionnaire and all survey responses were anonymous. After completing the questionnaire, participants were invited to enter a separate draw for one of six $50.00 shopping vouchers and to provide feedback about the survey. The raffle was drawn at the completion of data collection. Inclusion criteria were age of 18 years or older and use of benzodiazepines in the past 12 months (whether prescribed or non-prescribed). There were no additional exclusion criteria. The study was approved by the relevant ethics committees.