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Review

BZP-party pills: A review of research on benzylpiperazine as a recreational drug

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ABSTRACT

Background: BZP-party pills are yet another 'designer drug' which mimics the stimulant qualities of amphetamines and MDMA/Ecstasy. As legal markets for the substance have developed in the last decade (especially amongst young people) so has public and governmental concern.
Methods: This article provides a summary of the available international research on benzylpiperazine (BZP) and its popular use in the compound form known as 'party pills'. Through performing an analysis of the available medical and social scientific literature, the review outlines current knowledge on the compound, the prevalence of usage of BZP-party pills, as well as the associated harms, risks and rationales for use of the drug.
Results: Despite moves towards legislative control of BZP-party pills, the evidence presented suggests limited social and health harms associated with the drug, although research on long term effects is a significant gap in the literature. It also remains inconclusive as to whether BZP-party pills act as a 'gateway' to illegal drugs or, conversely, play a role in harm reduction with illegal drug users turning to legal alternatives; there is some evidence for both positions.
Conclusion: With increasing controls of BZP-party pills, and with the increasing numbers of 'legal highs' and new designer drugs on the market, we conclude that new legal alternatives will continue to surface to replace the drug in the future. Considering a harm reduction approach to drug taking, it is suggested that policy makers consider the creation of a legal holding category which restricts and regulates the market in legal highs whilst the social and health harms associated with each drug can be thoroughly investigated.

Introduction

As part of the recent growth in 'legal highs', benzylpiperazine (BZP) was first used as a recreational substance in Europe in 1999 (European Monitoring Centre for Drugs and Drug Addiction, 2009; Wikstrom, Holmgren, & Ahlner, 2004); markets have since developed in a number of countries including Bulgaria, the US, Australia, Sweden, Japan and South Africa. Between 2000 and 2008, however, New Zealand was the only country to develop a significant legal market for what has become known as 'BZP-party pills' (Bellamy, 2007; Social Tonics Association of New Zealand, 2005; Wilkins & Sweetsur, 2010). During this period, the country also produced a number of pieces of research on the drug which, together, make up a body of knowledge unmatched elsewhere in the world. This was recently acknowledged in a risk assessment on BZP carried out by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) (2009, p. 39) which stated, 'without doubt, BZP has been most prevalent in New Zealand . . . It is for this reason that much of the epidemiological and pharmacotoxicological data on BZP originate in that country'. A summation of the research from New Zealand as well as from other countries is outlined in this article. The legal trade in BZP-party pills was halted in New Zealand in 2008 following the introduction of new government legislation, reclassifying this group of drugs as Class C1 and, consequently, making it illegal to manufacture, import, export, supply, sell or consume BZP-party pills and related substances. By this point the BZP-party pill industry in New Zealand was worth an estimated NZ$50 million (approximately 22 million GBP) per year (Vince, 2006).

Method

Our goals for performing a literature search on BZP-party pills were twofold. Firstly, there was a need to review and catalogue the studies previously undertaken on the psychoactive properties of the drug (that is, studies that profiled the drug's effect on humans rather than articles related to BZP's pharmacological and technical qualities alone). Secondly, there was a need to retrieve scientific and grey literature which offered secondary analysis and further commentary of the available medical and social scientific literature on the drug.

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Literature searches were performed using the databases JSTOR, CINAHL, Sociological Abstracts, PsycINFO, IBSS (International Bibliography of the Social Sciences), Proquest, Project MUSE, Te Puna, Informit Database Collection, CSA Illumina, Expanded Academic, EBSCOHost and MEDLINE for the period up to June 2010. In addition, a search for peer reviewed and grey literature was undertaken via Google Scholar and through accessing relevant websites (for example, government health agencies or drug-related sites). Keywords utilised in this initial search were 'bzp', 'benzylpiperazine', and 'party pill(s)'. Due to the low level of sociological literature accessed, the search terms 'herbal high(s)', 'designer drug(s)', and 'legal high(s)' were added later. Following each search, titles and abstracts were screened by the reviewer (RB), and a decision was made as to which studies met the inclusion criteria. Following this, full copies of the publications were accessed and reviewed. A total of 82 scientific articles and grey literature reports were found of direct relevance to BZP-party pills. Of this total, just nine original medical or social research studies on the psychoactive effects of the drug on humans were found. Three of the studies were clinical-based trails, and all but one of the investigations (Sheridan & Butler, 2007) were quantitative-based. Six of the nine studies had been peer-reviewed, whilst only two of the studies were based outside of New Zealand. These research studies on BZP-party pills are summarised in Table 1. It should be noted that a randomised control trial of BZP-party pills has never been successfully completed with humans. Likewise, there has never been a representative population study on BZP-party pills.

Whilst the information was selected and reviewed in an objective manner, this is a narrative rather than a systematic review. The very limited literature available – as evidenced by some of the more sociologically orientated databases returning no results at all – means that the authors were more reliant on grey literature. There is still room, therefore, in a future review on BZP-party pills to perform a more systematic analysis of the published scientific material. It should be noted that much of the published research retrieved is concerned with BZP-party pills rather than BZP per se (that is, reproductions of the drug in pill form, rather than the compound itself). This is reflected in the findings, with terminology adopted that reflects the original data source.

Results

The substance

It has been mistakenly reported in the scientific literature and popular media that BZP was previously investigated as a potential antihelmic (Campbell, Cline, Evans, Lloyd, & Peck, 1973; Russell, 2006; Vince, 2006). It is likely that the confusion arises due to the product's similarity to 'piperazine', which is used as a worming agent (European Monitoring Centre for Drugs and Drug Addiction, 2008). Another notable erroneous association with BZP is its 'herbal' origins or 'natural' composition, despite the substance being entirely synthetic (Gee, Richardson, Woltersdorf, & Moore, 2005; Johnstone et al., 2007). Whilst it has no recognised medicinal use (European Monitoring Centre for Drugs and Drug Addiction, 2007), its potential as an antidepressant drug was explored in the 1970s (Advisory Council on the Misuse of Drugs, 2008; Campbell et al., 1973). However, it was rejected for this purpose due to its reported similarity to amphetamine, and for its abuse potential (Campbell et al., 1973; European Monitoring Centre for Drugs and Drug Addiction, 2007).

BZP is predominantly consumed in capsule or tablet form (Wilkins, Girling, Sweetsur, Huckle, & Huakau, 2006), as products more commonly known as 'party pills', 'herbal highs', 'P.E.P. pills', 'A2' and 'social tonics' (European Monitoring Centre for Drugs and Drug Addiction, 2007, 2009). Levels of BZP per pill can vary, with a typical dose per unit ranging between 50 and 200 mgs (personal communication, cited in European Monitoring Centre for Drugs and Drug Addiction, 2009). An analysis of levels of BZP in a range of 'party pill' products identified differing BZP content of between 28 and 133 mgs (with an average level of 65 mgs of BZP per pill) (Kenyon, Button, Ramsey, & Holt, 2007), although there have been reports of increasing levels of BZP per pill (Dawkins, 2008) as well as evidence of pills containing up to 1000 mgs of BZP (Gee et al., 2005) this is not believed to be commonplace. Following ingestion, it takes around two hours for the substance to take effect (Bye, Munro-Faure, Peck, & Young, 1973; Gee & Richardson, 2005). In undertaking this literature review, only two peer reviewed clinical trials of the effects of BZP on humans were identified (Bye et al., 1973; Campbell et al., 1973); the results of both studies indicate that BZP causes the same subjective and physiological effects as dexamphetamine (although much weaker, with BZP at around one tenth of the potency of dexamphetamine). The literature contains varying reports on the duration of the substance, which has been estimated to be anywhere between four and eight hours (Expert Advisory Committee on Drugs, 2004; Nikolova & Danchev, 2008; Wikstrom et al., 2004), and recent research suggests that BZP could be detected in the blood up to 30 h after ingestion (Antia, Lee, Kydd, Tingle, & Russell, 2009).

Whilst BZP forms the focus of this review, it should be noted that 'party pills' are often made up of a blend of BZP and trifluoromethylphenylpiperazine (TFMPP); when this is the case, the ratio of BZP to TFMPP in such pills can range from 2:1 to 10:1 (Thompson et al., 2006, p. 5). Both substances have been described as 'amphetamine-like compounds' (Russell, 2006, p. 46), with TFMPP, like BZP, being legal to sell and consume in New Zealand until the change in legislation in 2008. The effects of using BZP and TFMPP (alone or in combination) are still under investigation (Antia, Tingle, & Russell, 2009), with Russell (2006, p. 47) noting that the effects on humans of taking TFMPP alone have never been scientifically investigated. The European Monitoring Centre for Drugs and Drug Addiction (2009, p. 59) have recently commented on this BZP/TFMPP knowledge gap, stating that 'it is not clear which factors are solely due to BZP, which are solely due to TFMPP and which are due to the mixture'. However, Antia (2009, p. 56; see also Russell, 2006; Thompson et al., 2006) has supported the view that BZP has 'amphetamine-like effects . . . while TFMPP is said to reproduce the psychedelic effects of MDMA and other empathogenic drugs'. There is an important implication here for the present review of BZP-party pills in that the effects of the two different compounds may be confused, both by party pill users who may not know or remember how much (if any) TFMPP was in the pills they took, and by the researchers who have not, or are unable to, clearly differentiate the effects of the two compounds in their studies.

Size of market

In 2008, it was reported that there were over 120 party pill brands in New Zealand (Gee et al., 2008). The Social Tonics Association of New Zealand (2005) – an industry body representing major manufacturers, retailers, distributors and marketers of 'social tonics' including BZP products – claimed that eight million servings (meaning 'the number of pills or tablets used at one time'; for example, if the recommended dose is two pills, this is equivalent to one serving, Social Tonics Association of New Zealand, 2005, p. 6) of BZP-party pills and related products were sold between 2000 and 2005. The size or value of other international BZP-party pill markets is currently unknown (Wilkins, Girling, & Sweetsur, 2007). In a risk assessment report on BZP, The European Monitoring Centre for Drugs and Drug Addiction (2009) note that whilst there has been sporadic seizures of BZP-party pills across the European Union in