



Carisoprodol: an underrecognized drug of abuse in north India ☆☆☆

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ABSTRACT

Background: There is limited literature on clinical profile of subjects abusing carisoprodol.

Methods: Our series of 34 subjects shows that a typical subject was an unmarried, unemployed, urban resident from a nuclear family set up; was a substance abuser before being introduced to carisoprodol by another substance abuser; initiated the use to get a better “kick” and after regular use reported craving and withdrawal symptoms.

Results: The effect of carisoprodol was dose dependent: a majority reported a feeling of general wellbeing on consuming up to three tablets; a hypomanic state with 4–10 tablets and confusion, disorientation and drowsiness with >10 tablets at a time.

Conclusion: Thus being an underrecognized drug of abuse, carisoprodol is in need of wider awareness and regulatory measures to prevent its emergence as a greater menace in the future.

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1. Introduction

Carisoprodol or N-isopropylmeprobamate (brand names Carisoma and Soma) is a centrally acting muscle relaxant indicated in acute painful musculoskeletal conditions [1]. It was developed and promoted as a congener of meprobamate emphasizing better muscle relaxing properties, lower risk of overdose, and less potential for abuse [2]. Initially it was thought to be devoid of abuse potential [2]. However, later experience has established that it is associated with both abuse and impairment (i.e., increased risk of automobile accidents) [3].

It is usually prescribed for administration three times daily and at night in dosage formulations of 250 and 350 mg [4]. The onset of action is rapid (about 30 minutes) and the effects last about 2–6 hours. Metabolized in the liver via the cytochrome P450 oxidase isozyme CYP2C19, and excreted by the kidneys, it has a half-life of about 8 hours. The abuse potential can be attributed to a considerable proportion being metabolized to meprobamate, a known drug of abuse and dependence [5].

Tachycardia, involuntary movements, hand tremor, and horizontal gaze nystagmus may be specific carisoprodol intoxication effects [6]. Serotonergic and GABAergic systems are implicated for some of the

symptoms and signs of carisoprodol intoxications [7]. This may have implications for the clinical evaluation and treatment of such intoxications [8].

Recreational users of carisoprodol seek its muscle relaxing, anxiolytic, and sedating effects. Also, because of its potentiating effects on narcotics, it is often abused in conjunction with opioid drugs. Additionally, it is used as sexual performance enhancer and to prevent withdrawal among opioid addicted users [9–11]. It is believed that carisoprodol has gained reputation among drug abusers as an agent whose use begins as benign substitute for “harder” drugs and then escalates gradually for its own psychic effects. The “carry-over” phenomenon of dissemination of information from one addict to another makes the abuse of carisoprodol self-sustained. This is said to explain the spreading popularity of carisoprodol and it getting established as an addictive substance by itself [12].

In India carisoprodol was not considered a problem drug till recently. In 1999, the Ministry of Social Justice and Empowerment, Government of India (MSJE, GOI) and the United Nations International Drug Control Program, Regional Office for South Asia (UNIDCP, ROSA) started a large scale national survey for the extent, pattern and magnitude of substance abuse in India. The National Household Survey (NHS), a major component of this survey reported the following nationwide current prevalence profile: Alcohol was the commonest substance (21.4%), followed by cannabis (3%) and opioids (0.7%). Drug Abuse Monitoring Survey (DAMS) component of this survey, obtained from consecutive new patients/treatment seekers contacting various treatment facilities, again revealed alcohol as the commonest substance (43.9%), followed by opioids (26%) and cannabis (11.6%). Possibly because it was not listed in any of the

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survey forms that were to be filled by the data collectors, carisoprodol abuse was not reported by this survey [13].

However, all over the world in the past 2 decades, concern among the medical professionals about the abuse of carisoprodol has increased steadily [9–12,14–24]. Most of this literature consists of case reports of single or few cases with abuse or dependence [9,10,12,14–20]; in the last decade, a few reviews have been added [11,21,22].

Sikdar et al. [12] mentioned dose-related variable effects, i.e., 1–3 tablets (each tablet of 350 mg), general relaxation and drowsiness; 4–10 tablets, hypomania and >10 tablets, acute organic brain syndrome-like state.

Resultantly it is schedule IV controlled substance in several European countries [25,26] and since January 2012 in the US, too; but in India, carisoprodol is still freely available in the drug stores. This is mainly because it is not listed in Narcotic Drug Psychotropic Substance Act [27], as under this act, it is illegal for a person to produce/manufacture/cultivate, possess, sell, purchase, transport, store and consume the listed narcotic drug or psychotropic substance.

Data about therapeutic, toxic and withdrawal effects of carisoprodol intake in Indian setting are limited. The present research aimed to study the sociodemographic and clinical profile of subjects abusing carisoprodol.

2. Methodology

The study was conducted at the Drug De-addiction and Treatment Centre (DDTC) of a multispecialty tertiary-care teaching hospital providing services to a major area of north India. Most patients came by family or self-referral, and some were referred from other hospitals or other departments of our Institute.

The study was approved by the institutional research ethics committee. Patients reporting carisoprodol use were recruited consecutively from the patients who attended the DDTC between May 2010 and December 2011 (20 months). The data intake were done by N. Nebhinani. Diagnosis of substance dependence was made by a consultant psychiatrist as per ICD-10 [28].

A written informed consent was obtained from the patients taken up for the study. The inclusion criteria were patients who were using carisoprodol and gave informed consent for participation in the study; thus, those not using carisoprodol or not consenting were excluded from the study. An open-ended clinical interview was conducted to obtain the data on demographics and substance use, including carisoprodol.

2.1. Measures

Demographic form: it was used to record sex, age, mean years of education, occupation, marital status, religion, family and locality.

Clinical Form: specially developed for the study, it was used to collect information regarding ages of initiating any substance and carisoprodol, durations of carisoprodol use and dependence, onset and duration of carisoprodol action, dose and frequency of carisoprodol intake, source and reason of initiating carisoprodol, and carisoprodol related craving, tolerance, withdrawal, intoxication, harmful use etc.

2.2. Data analysis

The data were analyzed using SPSS version 14.0 for Windows (Chicago, IL, USA). Descriptive data were analyzed by percentage, mean, and standard deviation.

3. Result

Between May 2010 and December 2011 a total 3202 patients were registered in the DDTC and out of them 34 patients (nearly 1%) were using carisoprodol. All carisoprodol using patients were male with mean age of 27 years and formal education of 12 years. Majority were single (67%), from urban (70%), nuclear family (58%) and unemployed and Sikh by religion (55% each) (Table 1).

As mentioned in Table 2, most of the patients started using any substance at age 18 years, took nearly 5 years to start carisoprodol (23.5 years) and reported to us after another 5 years (including 3.6 years of using carisoprodol in a dependent pattern). Majority were also using opioids (88%; mainly heroin and dextropropoxyphene), and nearly half were using one or another form of tobacco (55.9%); while alcohol (17.6%), cannabis (17.6%) and sedatives (8.8%) remained less common substances.

Most of the patients were introduced to carisoprodol by friends or co-addicts (88.2%). Majority (70%) were using up to 10 tablets in a day (3500 mg) in two to three divided doses. Majority were taking carisoprodol to get better 'kick' (58%) or to combat withdrawal of mainly opioids (32%) or just out of curiosity (8.8%). Majority reported craving (97%) and tolerance (85%) for carisoprodol.

Most of the subjects reported dose-dependent effects of carisoprodol. Consumption of one to three tablets produced a feeling of general wellbeing and feeling energetic, while consumption of 4–10 tablets produced a hypomanic state characterized by overcheerfulness, psychomotor excitement, increased socialization and self-confidence. Higher one-time dose (>10 tablets) produced an acute organic brain syndrome-like state with confusion, disorientation, and partial amnesia for the events during such intake. Increased energy and pleasurable effects at all doses and escalating with dose increase were reported by 5 subjects (14.7%). Acute confusional state at relatively lower doses (seven to eight tablets) was reported by four subjects (11.8%).

More than two thirds of subjects (70%) reported one or another form of withdrawal symptoms; the commonest being restlessness (35%), followed by weakness/reduced energy (23%), aches and pains (20.5%), irritability (20%), reduced sleep (17.6%), lack of pleasure (11.7%), drowsiness (5.8%), watery stools (5.8%) and reduced appetite (2.9%).

Half of the subjects reported harmful use of carisoprodol (50%), though only minority (11.8%) had shifted to carisoprodol as the preferred substance. Also, less than half reported history of intoxication (41%) with the commonest manifestations being in the form of gait disturbance (35%), followed by tremors (32%), speech impairment (26%), impaired consciousness (26%), impaired vision (11.7%)

Table 1
Sociodemographic profile

Variable	Frequency/mean (S.D.)
Age (y)	27 (5.9)
Education (y)	12.38 (2.32)
Marital status	
Single	23 (67.6)
Married	11 (32.4)
Occupational status	
Working	15 (44.1)
Not working	19 (55.9)
Religion	
Hindu	15 (44.1)
Sikh	19 (55.9)
Family type	
Nuclear	20 (58.8)
Extended/joint	14 (41.2)
Locality	
Urban	24 (70.6)
Rural	10 (29.4)

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