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Carisoprodol

Updated: January 30, 2017.

OVERVIEW

Introduction

Carisoprodol is a centrally acting muscle relaxant that has been in use for more than fifty years without significant evidence for causing hepatic injury.

Background

Carisoprodol (kar eye" soe proe' dol) is a carbamate derivative similar to meprobamate. Its mechanism of action as a muscle relaxant is unknown, but it is a sedative and may act centrally by modifying perception of pain without affecting pain reflexes. Carisoprodol is recommended for treatment of acute, painful disorders of the musculoskeletal system. Carisoprodol is available in 250 and 350 mg tablets in generic formulations and under the trade names of Soma, Carisoma, Sodol and Vanadom. Fixed combinations of carisoprodol with aspirin or codeine are also available. The recommended adult dosage is 250 to 350 mg three to four times daily for 2 to 3 weeks. Carisoprodol was approved for use in the United States in 1959 and is widely used with more than 10 million prescriptions filled yearly. It is available by prescription only and is classified as a Schedule IV agent, meaning that it has low potential for abuse and physical or psychological dependence and has an accepted medical usefulness. Common side effects include dizziness, drowsiness and headache. Overdose can cause progressive obtundation, coma, neuromuscular rigidity, myoclonus and seizures.

Hepatotoxicity

There have been no adequate prospective studies demonstrating the rates of aminotransferase elevations on carisoprodol therapy or convincing case reports of clinically apparent liver injury due to carisoprodol. Thus, the hepatotoxic potential of this medication is low. It has been increasingly reported as a substance of abuse, taken in higher than recommended doses.

Likelihood score: E (Unlikely cause of clinically apparent liver injury).

Drug Class: Muscle Relaxants

PRODUCT INFORMATION

REPRESENTATIVE TRADE NAMES

Carisoprodol – Generic, Soma®

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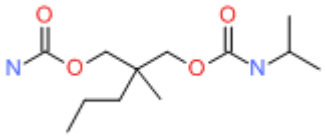
DRUG CLASS

Autonomic Agents: Muscle Relaxants, Central

COMPLETE LABELING

Product labeling at DailyMed, National Library of Medicine, NIH

CHEMICAL FORMULA AND STRUCTURE

DRUG	CAS REGISTRY NO	MOLECULAR FORMULA	STRUCTURE
Carisoprodol	78-44-4	C12-H24-N2-O4	

ANNOTATED BIBLIOGRAPHY

References updated: 30 January 2017

Zimmerman HJ. Muscle spasmolytics. In, Hepatotoxicity: The Adverse Effects of Drugs and Other Chemicals on the Liver. 2nd Ed. Philadelphia: Lippincott, 1999. p. 544-45.

(Expert review of hepatotoxicity published in 1999; discusses dantrolene, chlorzoxazone and baclofen, but not carisoprodol).

Hibbs RE, Zambon AC. Agents acting at the neuromuscular junction and autonomic ganglia. In, Brunton LL, Chabner BA, Knollman BC, eds. Goodman & Gilman's The pharmacological basis of therapeutics, 12th ed. New York: McGraw-Hill, 2011. p. 255-76.

(Textbook of pharmacology and therapeutics).

Goldberg D. Carisoprodol toxicity. Military Med 1969; 134: 597-601. PubMed PMID: 4979454.

(Case report of patient with intentional carisoprodol overdose presented with twitching and coma requiring intubation, but ultimately recovered; no mention of liver abnormalities).

Roth BA, Vinson DR, Kim S. Carisoprodol-induced myoclonic encephalopathy. J Toxicol Clin Toxicol 1998; 36: 609-12. PubMed PMID: 9776967.

(Case report of patient with carisoprodol overdose who developed coma, but had no liver abnormalities).

Chou R, Peterson K, Helfand M. Comparative efficacy and safety of skeletal muscle relaxants for spasticity and musculoskeletal conditions: a systematic review. J Pain Symptom Manage 2004; 28: 140-75. PubMed PMID: 15276195.

(Thorough review of the pharmacology, efficacy and side effects of the muscle relaxants).

Toth PP, Urtis J. Commonly used muscle relaxant therapies for acute low back pain: a review of carisoprodol, cyclobenzaprine hydrochloride, and metaxalone. Clin Ther 2004; 26: 1355-67. PubMed PMID: 15530999.

(A review of safety and efficacy of muscle relaxants metnions that the major adverse effects of carisoprodol are drowsiness, dizziness, vertigo, ataxia, tremor, irritability and headache, and that its potential for abuse and dependence limit its usefulness for rehabilation).

Russo MW, Galanko JA, Shrestha R, Fried MW, Watkins P. Liver transplantation for acute liver failure from drug-induced liver injury in the United States. Liver Transpl 2004; 10: 1018-23. PubMed PMID: 15390328.

(Among ~50,000 liver transplants done in the US between 1990 and 2002, 270 [0.5%] were done for drug induced acute liver failure, but none were attributed to a specific muscle relaxant).

Reuben A, Koch DG, Lee WM; Acute Liver Failure Study Group. Drug-induced acute liver failure: results of a U.S. multicenter, prospective study. Hepatology 2010; 52: 2065-76. PubMed PMID: 20949552.

(Among 1198 patients with acute liver failure enrolled in a US prospective study between 1998 and 2007, 133 were attributed to drug induced liver injury, none of which were attributed to muscle relaxants).

Reeves RR, Burke RS, Kose S. Carisoprodol: update on abuse potential and legal status. South Med J 2012; 105: 619-23. PubMed PMID: 23128807.

(Review of the abuse of carisoprodol and its classification as a schedule IV class agent).

Hernández N, Bessone F, Sánchez A, di Pace M, Brahm J, Zapata R, A Chirino R, et al. Profile of idiosyncratic drug induced liver injury in Latin America: an analysis of published reports. Ann Hepatol 2014; 13: 231-9. PubMed PMID: 24552865.

(Among 176 reports of drug induced liver injury from Latin America published between 1996 and 2012, none were attributed to carisoprodol or other muscle relaxants).

Chalasani N, Bonkovsky HL, Fontana R, Lee W, Stolz A, Talwalkar J, Reddy KR, et al.; United States Drug Induced Liver Injury Network. Features and outcomes of 899 patients with drug-induced liver injury: The DILIN Prospective Study. Gastroenterology 2015; 148: 1340-1352. PubMed PMID: 25754159.

(Among 899 cases of drug induced liver injury enrolled in a US prospective study between 2004 and 2013, 5 [0.7%] were attributed to muscle relaxants [2 to dantrolene, and 1 each to baclofen, metaxalone and tizanidine], but none were attributed to carisoprodol).