

**American Academy of Clinical Toxicology  
Herbs & Dietary Supplements Special Interest Group  
Abstracting Service  
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1. Bodson Q, Denooz R, Serpe P, Charlier C. Gamma-hydroxybutyric acid (GHB) measurement by GC-MS in blood, urine and gastric contents, following an acute intoxication in Belgium. *Acta Clin Belg.* 2008;63(3):200-8. PMID: 18714853

Gamma-hydroxybutyrate (GHB, sodium oxybate) is a compound related to neuromodulator gamma-aminobutyric acid (GABA), emerging as a recreational drug of abuse and as a rape drug. GHB-related emergencies have dramatically increased in the 1990s, but a decrease is observed since 2000. We describe the case of an acute GHB intoxication in a 28-year-old male who fell unconscious after ingestion of a mouthful of an unknown beverage, and required medical support for 2 days. A cocaine abuse was also detected by preliminary toxicological screening, but the clinical presentation was not typical of cocaine intoxication. A simple liquid-liquid extraction was used for quantitation of GHB, followed by disilyl-derivatization and analysis in selective ion monitoring (SIM) mode by gas chromatography-mass spectrometry (GC-MS), using GHB-d6 as internal standard. High concentrations of GHB were detected in urine (3020 mg/L) and gastric contents (71487 mg/L) at admission. After a 6-hours delay, GHB was still present in urine at 2324 mg/L and in blood at 43 mg/L. The clinical symptoms of cocaine intoxication were diminished by GHB consumption, and the cerebral scan was modified. Attention must thus be paid to acute intoxications with surprising clinical symptoms, and GHB has probably to be added to the preliminary toxicological screening. Data available regarding GHB are briefly reviewed, and our results are compared with previously published reports of non-fatal GHB intoxication.
2. Zhao ZY, Liang L, Fan X, Yu Z, Hotchkiss AT, Wilk BJ, Eliaz I. The role of modified citrus pectin as an effective chelator of lead in children hospitalized with toxic lead levels. *Altern Ther Health Med.* 2008;14(4):34-8. PMID: 18616067

CONTEXT: Lead toxicity is an ongoing concern worldwide, and children, the most vulnerable to the long-lasting effects of lead exposure, are in urgent need of a safe and effective heavy metal chelating agent to overcome the heavy metals and lead exposure challenges they face day to day. OBJECTIVE: This clinical study was performed to determine if the oral administration of modified citrus pectin (MCP) is effective at lowering lead toxicity in the blood of children between the ages of 5 and 12 years. METHOD: Hospitalized children with a blood serum level greater than 20 microg/dL, as measured by graphite furnace atomic absorption spectrometry (GFAAS), who had not received any form of chelating and/or detoxification medication for 3 months prior were given 15 g of MCP (PectaSol) in 3 divided dosages a day. Blood serum and 24-hour urine excretion collection GFAAS analysis were performed on day 0, day 14, day 21, and day 28. RESULT: This study showed a dramatic decrease in blood serum levels of lead (P = .0016; 161% average change) and a dramatic increase in 24-hour urine collection (P = .0007; 132% average change). CONCLUSION: The need for a gentle, safe heavy metal-chelating agent, especially for children with high environmental chronic exposure, is great. The dramatic results and no observed adverse effects in this pilot study along with previous reports of the safe and effective use of MCP in adults indicate that MCP could be such an agent. Further studies to confirm its benefits are justified.
3. Kim SY, Barker JC, Anderson IB, Dyer JE, Earnest G, Blanc PD. Systematic assessment of gamma hydroxybutyrate (GHB) effects during and after acute intoxication. *Am J Addict.* 2008;17(4):312-8. PMID: 18612887

We adapted and tested a previously published questionnaire battery eliciting sensory and cognitive symptoms during (acute) and immediately after (post-acute) GHB intoxication.

Studying 125 GHB users, we assessed the instrument's internal consistency using Cronbach's alpha (CA) and responsiveness to change comparing acute and post-acute symptoms. The final 14-item battery demonstrated good internal consistency (CA  $\geq$  0.85, both acute and post-acute). The median symptom score (possible range 0-64) was 30 (acute) and 6 (post-acute; difference  $p < 0.001$ ). This modified substance-specific symptom battery, which is easily administered, demonstrated excellent performance characteristics. It can be used to study GHB and, potentially, related drugs of abuse.

4. Cleveland LM, Minter ML, Cobb KA, Scott AA, German VF. Lead hazards for pregnant women and children: part 1: immigrants and the poor shoulder most of the burden of lead exposure in this country. Part 1 of a two-part article details how exposure happens, whom it affects, and the harm it can do. *Am J Nurs.* 2008;108(10):40-9; quiz 50. PMID: 18827541  
Poor, urban, and immigrant populations are at far greater risk for lead exposure than are other groups in the United States. Children with even slightly elevated blood lead levels are at increased risk for significant neurobehavioral problems that can extend through adolescence. Research has shown that elevated blood lead levels in pregnant women, even those well below 10 micrograms per deciliter-the Centers for Disease Control and Prevention's "level of concern"-can cause miscarriage, premature birth, low birth weight, and subsequent developmental delays in their children. Despite these well-established dangers, routine prenatal lead screening and lead education is not a standard of care. Part 1 of this two-part article presents a short case example of a pregnant mother with lead poisoning and describes the epidemiology of lead exposure in the United States, the main sources of lead exposure, and the effects of lead on the pregnant mother and the developing fetus and child. Prevention is crucial. Treatment options such as chelation must be used selectively and will not reverse damage once it's occurred. Part 2 will describe recommendations for screening, education, nutrition, reducing environmental exposures, and treatment.
5. Krieg EF, Jr., Chrislip DW, Brightwell WS. A meta-analysis of studies investigating the effects of lead exposure on nerve conduction. *Arch Toxicol.* 2008;82(8):531-42. PMID: 18421440  
Group means from nerve conduction studies of persons exposed to lead were used in a meta-analysis. Differences between the control and exposed groups, and the slopes between nerve conduction measurements and  $\log(10)$  blood lead concentrations were estimated using mixed models. Conduction velocity was reduced in the median, ulnar, and radial nerves in the arm, and in the deep peroneal nerve in the leg. Distal latencies of the median, ulnar, and deep peroneal nerves were longer. No changes in the amplitudes of compound muscle or nerve action potentials were detected. The lowest concentration at which a relationship with blood lead could be detected was 33.0 microg/dl for the nerve conduction velocity of the median sensory nerve. Lead may reduce nerve conduction velocity by acting directly on peripheral nerves or by acting indirectly, for example, on the kidney or liver.
6. Protecting the environment--and protecting children from mercury exposure. *Child Health Alert.* 2008;26(3). PMID: 18828184
7. Hydzik P, Bielanski W, Ponka M, Wojcicki M, Lubikowski J, Pach J, Pawlik W. Usefulness of  $^{13}\text{C}$ -methacetin breath test in liver function testing in *Amanita phalloides* poisoning; breast feeding woman case. *Clin Toxicol (Phila).* 2008:1-6. PMID: 18821093  
Introduction. Mortality from ingestion of the mushroom *Amanita phalloides* still remains as high as 8-10%. In critical patients, liver dialysis can bridge the patient to liver transplantation, which may be a lifesaving procedure. We report the use of  $^{13}\text{C}$ -methacetin breath test ( $^{13}\text{C}$ -MBT) in monitoring hepatic function in a case of *A. phalloides* poisoning. Case report. A 33-year-old woman ate mushrooms that she had picked. After 8 h, she developed nausea and vomiting,

abdominal cramps, and diarrhea, which lasted for another 24 h. On the third day, features of liver injury were seen. Pharmacologic therapy failed and she underwent liver dialysis on days 4 and 5. A 13C-MBT was used to evaluate hepatic functional reserve before the first and after the second dialysis. A liver transplantation on day 6 was successful. Discussion. The breath test results showed that at 40 min after substrate ingestion the mean 13C-MBT cumulative oxidation percentage was 10.5 +/- 3.8% in healthy controls, whereas in our patient this parameter decreased from 0.09% on the fourth day to 0.02% on the fifth day. Conclusions. 13C-MBT is a simple, non-invasive diagnostic tool which may be useful as a predictor of outcome and as a marker of the severity of liver damage.

8. Jacob SE, Stechschulte S. Formaldehyde, aspartame, and migraines: a possible connection. *Dermatitis*. 2008;19(3):E10-1. PMID: 18627677  
Aspartame is a widely used artificial sweetener that has been linked to pediatric and adolescent migraines. Upon ingestion, aspartame is broken, converted, and oxidized into formaldehyde in various tissues. We present the first case series of aspartame-associated migraines related to clinically relevant positive reactions to formaldehyde on patch testing.
9. Ramirez Santos A, Fernandez-Redondo V, Perez Perez L, Concheiro Cao J, Toribio J. Contact allergy from vitamins in cosmetic products. *Dermatitis*. 2008;19(3):154-6. PMID: 18627689  
We report three new cases of allergic contact dermatitis due to vitamins in cosmetic creams. The first patient was diagnosed with worsening rosacea but had allergic contact dermatitis from alpha-tocopherol in a moisturizing cream. The second and third cases presented as acute eyelid dermatitis due to vitamin K in eyelid lifter creams. Repeated open application testing and patch tests with the actual products and individual components of the creams were useful in establishing the diagnosis.
10. Wang E, Wylie-Rosett J. Review of selected Chinese herbal medicines in the treatment of type 2 diabetes. *Diabetes Educ*. 2008;34(4):645-54. PMID: 18669806  
PURPOSE: The purpose of this article is to examine how Chinese herbal medicines are used in the treatment of diabetes, focusing on potential benefits and risks. METHODS: Medline, expert interviews, and Internet searches were used to identify Chinese herbal medicines with antidiabetic properties and their diabetes-related health claim, proposed antidiabetic effect, adverse effects, contraindications, and drug interactions. RESULTS: Twenty-three herbs and 5 herbal formulas were selected for review. Antidiabetic health claims included increasing serum insulin, decreasing blood glucose, increasing glucose metabolism, and/or stimulating pancreatic function. Side effects were few or not reported. CONCLUSIONS: The use of Chinese herbal medicines in diabetes is promising but still far from proven. Diabetes educators need to be aware of the risks and benefits of herbal medicines. Patients should be asked about the use and source of herbal medicines and carefully monitored for drug interactions and adverse effects.
11. Fox DA, Kala SV, Hamilton WR, Johnson JE, O'Callaghan JP. Low-level human equivalent gestational lead exposure produces supernormal scotopic electroretinograms, increased retinal neurogenesis, and decreased retinal dopamine utilization in rats. *Environ Health Perspect*. 2008;116(5):618-25. PMID: 18470321  
BACKGROUND: Postnatal lead exposure in children and animals produces alterations in the visual system primarily characterized by decreases in the rod-mediated (scotopic) electroretinogram (ERG) amplitude (subnormality). In contrast, low-level gestational Pb exposure (GLE) increases the amplitude of scotopic ERGs in children (supernormality). OBJECTIVES: The goal of this study was to establish a rat model of human equivalent GLE and to determine dose-response effects on scotopic ERGs and on retinal morphology, biochemistry, and dopamine metabolism in adult offspring. METHODS: We exposed female Long-Evans hooded rats to water

containing 0, 27 (low), 55 (moderate), or 109 (high) ppm of Pb beginning 2 weeks before mating, throughout gestation, and until postnatal day (PND) 10. We measured maternal and litter indices, blood Pb concentrations (BPb), retinal Pb concentrations, zinc concentrations, and body weights. On PND90, we performed the retinal experiments. RESULTS: Peak BPb concentrations were < 1, 12, 24, and 46 microg/dL in control, low-, moderate- and high-level GLE groups, respectively, at PNDs 0-10. ERG supernormality and an increased rod photoreceptor and rod bipolar cell neurogenesis occurred with low- and moderate-level GLE. In contrast, high-level GLE produced ERG subnormality, rod cell loss, and decreased retinal Zn levels. GLE produced dose-dependent decreases in dopamine and its utilization. CONCLUSIONS: Low- and moderate-level GLE produced persistent scotopic ERG supernormality due to an increased neurogenesis of cells in the rod signaling pathway and/or decreased dopamine utilization, whereas high-level GLE produced rod-selective toxicity characterized by ERG subnormality. The ERG is a differential and noninvasive biomarker of GLE. The inverted U-shaped dose-response curves reveal the sensitivity and vulnerability of the developing retina to GLE.

12. Kang YJ. Herbogenomics: from traditional Chinese medicine to novel therapeutics. *Exp Biol Med (Maywood)*. 2008;233(9):1059-65. PMID: 18535158  
Traditional Chinese medicine (TCM) has a long history of development and application and has demonstrated on evidence basis its efficacy in the treatment of many diseases affecting multiple organ systems. In particular, TCM is effective in the prevention and treatment of chronic diseases and metabolic syndromes. However, the value of TCM has not been fully recognized worldwide due to the lack of definitive information of active ingredients in almost any TCM preparation. Novel functional genomics and proteomics approaches provide alternate perspectives on the mechanism of action of TCM. The target molecules on which TCM either activates or inactivates can be identified by functional genomics and proteomics, thus the affected critical signaling pathway cascades leading to effective recovery of chronic diseases can be studied. Several TCM preparations have been available for the treatment of liver fibrosis and cirrhosis, even advanced liver cirrhosis that has been shown to be irreversible and has no US-FDA approved therapy. In the TCM-treated livers with fibrosis and cirrhosis, some critical molecules that are significantly involved in the recovery can be identified through functional genomics and proteomics studies. These molecules become novel targets for drug discovery and development and candidates for the development of gene therapy. Gene therapy developed based on this strategy for the treatment of advanced liver fibrosis and cirrhosis in animal models has obtained promising results. This process thus establishes a herbogenomics approach to understand mechanisms of action of TCM and to identify effective molecular targets for the discovery and development of novel therapeutics.
13. Poon WT, Ho CH, Yip KL, Lai CK, Cheung KL, Sung RY, Chan AY, Mak TW. Grayanotoxin poisoning from *Rhododendron simsii* in an infant. *Hong Kong Med J*. 2008;14(5):405-7. PMID: 18840915  
We report a case of severe poisoning in a 57-day-old infant who presented with vomiting, convulsions, and shock after ingesting a bottle of milk containing a decoction of *Rhododendron simsii*. The grandmother collected this toxic plant from a cultivated area, believing it was good for the airways. Grayanotoxin was detected in both the urine and plant specimens. The infant made a good recovery after requiring ventilatory support for 2 days. *Rhododendron* is a common gardening shrub in Hong Kong. Some *Rhododendron* species are poisonous and contain grayanotoxin. Intentional or accidental ingestion of toxic plants can be severe or even life-threatening. It is therefore essential that clinicians be familiar with local toxic plant species.
14. Sheth A, Khurana R, Khurana V. Potential liver damage associated with over-the-counter vitamin supplements. *J Am Diet Assoc*. 2008;108(9):1536-7. PMID: 18755329

The growing popularity and availability of over-the-counter (OTC) health products, including vitamins, raises serious concern about vitamin toxicity. We report a case of cirrhosis in a patient with habitual daily ingestion of an OTC dietary supplement that contained 13,000 microg vitamin A and was associated with marked clinical improvement after discontinuation. This case highlights the potential for liver damage that may be associated with long-term intake of OTC vitamin supplements, and indicates the need for medical supervision of such products.

15. Brumback RA. A never ending saga: the mercury and autism articles by Ip et al. *J Child Neurol.* 2008;23(7):725. PMID: 18658071
16. Cohen DL, Del Toro Y. A case of valerian-associated hepatotoxicity. *J Clin Gastroenterol.* 2008;42(8):961-2. PMID: 18431248
17. Camuglia JE, Grigoriadis G, Gilfillan CP. Lead poisoning and Burton's line. *Med J Aust.* 2008;189(6):339. PMID: 18803541
18. Freeman C, Spelman K. A critical evaluation of drug interactions with Echinacea spp. *Mol Nutr Food Res.* 2008;52(7):789-98. PMID: 18618481  
Accurate information concerning drug-herb interactions is vital for both healthcare providers and patients. Unfortunately, many of the reviews on drug-herb interactions contain overstated or inaccurate information. To provide accurate information on drug-herb interactions healthcare providers must account for product verification, dosage, medicinal plant species, and plant part used. This critical review assessed the occurrence of drug interactions with one of the top selling botanical remedies, echinacea including Echinacea angustifolia, E. pallida, and E. purpurea. Only eight papers containing primary data relating to drug interactions were identified. Herbal remedies made from E. purpurea appear to have a low potential to generate cytochrome P450 (CYP 450) drug-herb interactions including CYP 450 1A2 (CYP1A2) and CYP 450 3A4 (CYP3A4). Currently there are no verifiable reports of drug-herb interactions with any echinacea product. However, further pharmacokinetic testing is necessary before conclusive statements can be made about echinacea drug-herb interactions. Given our findings, the estimated risk of taking echinacea products (1 in 100,000), the number of echinacea doses consumed yearly (> 10 million), the number of adverse events (< 100) and that the majority of use is short term, E. purpurea products (roots and/or aerial parts) do not appear to be a risk to consumers.
19. Markowitz JS, von Moltke LL, Donovan JL. Predicting interactions between conventional medications and botanical products on the basis of in vitro investigations. *Mol Nutr Food Res.* 2008;52(7):747-54. PMID: 18324706  
The potential for various natural products to perturb the metabolism and disposition of medications has been recognized for decades. There are numerous in vitro and in vivo methods available to screen botanical products for drug interaction potential. Although many normal volunteer botanical-drug interaction studies have been performed, clearly, in vitro studies assessing the potential for drug interactions with various natural products represent the predominant type of published research performed to date. In addition to the recognized limitations of in vitro screening methodologies to assess conventional drug interactions, further difficulties emerge when examining botanical products. Primary challenges include assigning hepatic concentrations and accounting for bioavailability, distribution, first-pass metabolism and active metabolites. Additionally, variability in the chemical composition of commercially available botanical supplements, the lack of analytical standards and the inability to accurately screen the entities as mixtures add to complexities in experimental design. This mini-review is intended to address the particular problems and challenges in evaluating botanical supplements using in vitro methods, and review what can and cannot be learned from such investigations.

20. Peterson E, Stoebner A, Weatherill J, Kutscher E. Case of acute psychosis from herbal supplements. *S D Med*. 2008;61(5):173-7. PMID: 18630028  
A recent study estimates that 15.2 percent of American adults use nonprescription dietary supplements for weight loss. Sale of ephedrine- and ephedrine-alkaloid-containing products was prohibited by the Food and Drug Administration in February 2004 after research demonstrated an increased risk of arrhythmia, mortality and hypertension following use of products containing these sympathomimetics. Subsequently, nutritional supplement manufacturers have turned to other products to promote weight loss. The following paper reports a case study of a 28-year-old woman with no prior psychiatric history who was hospitalized secondary to an acute psychotic episode. The patient reported starting several weight-loss and nutritional sports supplements approximately one week prior to admission. The relationship between the onset of psychosis and the initiation of the dietary supplements strongly suggests a correlation exists. Heightened consumer education regarding the contents of dietary supplements, along with their potential for causing adverse effects when used alone or in combination with other medications, is warranted. Patients who choose to take dietary supplements should be encouraged to inform their health care providers about the supplements they are taking.
21. Song HJ, Shim KN, Ryu KH, Kim TH, Jung SA, Yoo K. A case of ischemic colitis associated with the herbal food supplement ma huang. *Yonsei Med J*. 2008;49(3):496-9. PMID: 18581601  
Ischemic colitis is a condition that usually occurs in the elderly, as a form of vascular disease. However, ischemic colitis also occurs, though rarely, in healthy young adults. Moreover, food supplements containing *Ephedra sinica* or ma huang have been linked to adverse central nervous and cardiovascular events. A 40-year-old man was admitted to our emergency department after 2 episodes of abdominal pain and bloody diarrhea that lasted 24 hours. His medical history was unremarkable for risk factors of bowel ischemia, except for well-controlled hypertension. However, a weight-loss supplement, *Ephedra sinica*, had been prescribed for daily use during the previous month. Both abdominal/pelvic computed tomography and colonoscopy revealed findings compatible with ischemic colitis. His conditions spontaneously improved without any serious complications, and he was advised to discontinue the use of herbal medications containing ephedrine. In this paper, we describe a case of ischemic colitis that was potentially linked to the use of ma huang with a review of the relevant literature.