

# AACT Herbal Dietary Supplement Section Abstracts

## July 2024

1. **Plant-origin rotenone poisoning – a rare cause of metabolic acidosis with hyperlactatemia diagnosed with DNA barcoding of gastric contents.** Yu KYC, Lam YH, Ng SW, Cheung YT, Tseung JSB, Tong HF, Chong YK.

Clinical Toxicology, 62(6), 407-408

PMID:38864889

DOI <https://doi.org/10.1080/15563650.2024.2350597>

(Letter)

2. **Podophyllin Toxicity: Case Report of a Rare Poisoning.** Thekkayil SSM, Golani M, Mahalakshmi M, Golani D, Kalra TS, Yadav R.

J Assoc Physicians India. 2024 Jul;72(7):97-99.

Podophyllin poisoning is a rare but serious emergency, often fatal, that involves multiple systems, predominantly the nervous system. Usually, it results from the resin extract derived from certain plants, and podophyllotoxin is the most toxic chemical present in it. The toxicity mechanisms involve suppression of cellular nucleoside transport and microtubule disruption. Due to the delayed onset of symptoms, there can be a delay in diagnosing and treating the condition. In addition, the initial and dominant central nervous system (CNS) symptoms can be mistaken for CNS infection or brainstem stroke. Therefore, early diagnosis (based on a high degree of suspicion, and circumstantial evidence) and prompt treatment (primarily decontamination and supportive care) are crucial to prevent unfavorable outcomes. We present a rare case of a 23-year-old male who accidentally ingested podophyllin and initially experienced severe neurological symptoms, subsequently developing into multisystem involvement and culminating in death within 4 days of its ingestion.

DOI: 10.59556/japi.72.0406

PMID: 38990594 [Indexed for MEDLINE]

3. **Kratom safety and toxicology in the public health context: research needs to better inform regulation.** Henningfield JE, Grundmann O, Huestis MA, Smith KE.

Front Pharmacol. 2024 Jun 3;15:1403140.

Although kratom use has been part of life for centuries in Southeast Asia, the availability and use of kratom in the United States (US) increased substantially since the early 2000s when there was little information on kratom pharmacology, use patterns, and effects, all critical to guiding regulation and policy. Here we provide a synthesis of research with several hundred English-language papers published in the past 5 years drawing from basic research, epidemiological and surveillance data, and recent clinical research. This review of available literature aims to provide an integrated update regarding our current understanding of

kratom's benefits, risks, pharmacology, and epidemiology, which may inform United States-based kratom regulation. Recent surveillance indicates there are likely several million past-year kratom consumers, though estimates vary widely. Even without precise prevalence data, kratom use is no longer a niche, with millions of United States adults using it for myriad reasons. Despite its botanical origins in the coffee tree family and its polypharmacy, kratom is popularly characterized as an opioid with presumed opioid-system-based risks for addiction or overdose. Neuropharmacology, toxicology, and epidemiology studies show that kratom is more accurately characterized as a substance with diverse and complex pharmacology. Taken together the work reviewed here provides a foundation for future scientific studies, as well as a guide for ongoing efforts to regulate kratom. This work also informs much-needed federal oversight, including by the United States Food and Drug Administration. We conclude with recommendations for kratom regulation and research priorities needed to address current policy and knowledge gaps around this increasingly used botanical product.

DOI: 10.3389/fphar.2024.1403140

PMCID: PMC11180979

PMID: 38887550

4. **Severe jaundice with life-threatening liver failure after Kratom use: Reversed by plasma exchange.** Dasgupta A, Ye Z.

Transfus Apher Sci. 2024 Jun;63(3):103898.

Kratom is an herbal supplement which is used for its stimulating properties and pain reduction due to interaction with opioid receptors. Kratom overdose may cause fatality. A 56-year-old man was admitted to the emergency department with severe jaundice and liver failure. His total bilirubin reached at 70.6 mg/dL, but extensive workup did not show any liver mass. Family informed that the patient was taking Kratom. Plasma exchange was suggested as an unconventional therapy and consent from the patient was obtained because this procedure has never been performed to treat Kratom toxicity before. After four procedures, his total bilirubin was reduced to 23.9 mg/dL and his clinical condition improved significantly. Finally on day 5 he was discharged at stable condition with a total bilirubin value of 21.3 mg/dL. There is no antidote for Kratom, and treatment is supportive. To our knowledge this is the first report of reversing Kratom poisoning using plasma exchange.

DOI: 10.1016/j.transci.2024.103898

PMID: 38341316 [Indexed for MEDLINE]

5. **Acute liver failure secondary to green tea extract.** Fletcher C, Strasser SI, Liu K, McKenzie C

Pathology. 2024 Jun;56(4):597-599. doi: 10.1016/j.pathol.2023.09.018. Epub 2023 Nov 25.

DOI: 10.1016/j.pathol.2023.09.018

PMID: 38071155 [Indexed for MEDLINE]

6. **Cassia angustifolia and tacrolimus interaction in a liver transplant patient, a case report.** Beltrá-Picó I, Díaz-González M, Nalda-Molina R, Ramon-Lopez A, Pascual-Bartolomé S, Miralles-Macià CF, Rodríguez-Soler M, Más-Serrano P.

Br J Clin Pharmacol. 2024 Jul;90(7):1745-1750. doi: 10.1111/bcp.16079. Epub 2024 Apr 24.

*Cassia angustifolia* is a species of plant from the Senna family that has traditionally been used as a laxative in different herbal products and commercial medicines. Even though there are few documented drug-plant interactions, the use of *C. angustifolia* with different drugs may have additive effects, such as with other laxatives or potassium-depleting diuretics. Its use also increases peristalsis which, may reduce drug absorption. The combination with digoxin has been associated with an increased risk of digoxin toxicity, probably due to an increase in plasma digoxin concentrations and hypokalaemia. We present a case with supratherapeutic trough concentration of tacrolimus, an immunosuppressive agent, and a herbal product in a liver transplant patient after concomitant intake of tacrolimus and a herbal product based on *C. angustifolia*, suggesting a possible drug-plant interaction through P-glycoprotein. We observed an increase in the patient's blood concentration 2.8-fold and the area under the curve at steady state 2.1-fold. This interaction could be of clinical relevance, given the dose-dependent side effects of tacrolimus, such as nephrotoxicity, neurotoxicity, hypertension, hyperglycaemia, or electrolyte alterations.

DOI: 10.1111/bcp.16079

PMID: 38657592 [Indexed for MEDLINE]

7. **Advances in the mechanism of emodin-induced hepatotoxicity.** Wang Y, Zhao M, Li B, Geng X.

Heliyon. 2024 Jun 25;10(13).

Emodin is a naturally occurring anthraquinone derivative and serves as an active component in various traditional Chinese herbal medicines. It is widely known for its broad pharmacological effects, including anti-inflammatory, antioxidant, and anticancer properties. However, high doses and long-term use of emodin can also lead to liver toxicity. Nevertheless, the mechanism of emodin-induced liver toxicity remains unclear at present. This article aims to summarize the toxicological research progress on emodin, with a particular focus on elucidating the mechanisms underlying emodin-induced hepatocyte injury. By providing essential information, the study intends to facilitate further research and safe usage of emodin for researchers and clinical practitioners.

DOI: 10.1016/j.heliyon.2024.e33631

PMCID: PMC1125441

PMID: 39027614

8. **Mechanisms of liver injuries caused by traditional Chinese medicines.** Jin SF, Pan Q, Zhou JP, Pan XP.

Hepatobiliary Pancreat Dis Int. 2024 Jun;23(3):310-312.

DOI: 10.1016/j.hbpd.2023.05.005

PMID: 37217410 [Indexed for MEDLINE]

9. **Silent Destruction: Fulminant Hepatitis and the Hidden Danger of Weight Loss Drugs.** de Ataíde EC, Perales SR, Bento APN, Teramoto FD, Lima MTF, Cunha-Silva M, Moisés CB, Kawamoto do Nascimento LF, Aguiar V, Sevá-Pereira T, Garcia A, Boin ISFSF.

Transplant Proc. 2024 Jul 4:S0041-1345(24)00268-9.

**INTRODUCTION:** The use of natural products for therapeutic purposes is a common practice throughout the world, in part, due to the global obesity epidemic and the search for products with appetite suppression and weight loss properties, which include nutritional supplements, vitamins and minerals to herbal products. It is known that such products may be associated with various adverse health effects. Thus, the objective of this study is to report a series of cases of patients, who presented fulminant liver failure (HFI) requiring liver transplantation (LT), related to the consumption of products used for weight loss.

**MATERIAL AND METHODS:** This is a retrospective cohort based on the evaluation of patients listed for LT due to IHF at the Hospital das Clínicas of the Universidade Estadual de Campinas, between 1991 and 2022, with patients who had confirmed consumption of products with the aim of loss being selected. **RESULTS:** During the studied period, 92 patients were listed for HT due to IHF according to the Kings College criteria, with 5 cases being selected with proven consumption of herbal products for weight loss, and other causes that could explain the IHF were excluded. Four (80%) of the patients were emale, with a mean age of 40.5 years, and 40% of the cases died.

**DISCUSSION AND CONCLUSIONS:** Unlike traditional pharmaceutical medicines, in most countries, the commercialization of these products is not conditioned on clinical and safety evidence or prior approval by regulatory bodies. Hepatotoxicity can be related to several factors, such as the presence of toxins naturally found in plants, the presence of heavy metals, contamination during obtaining or processing and the addition of substances omitted from the labels. The use of weight loss products can evolve with IHF, a fact that deserves attention, due to ease of access and growing demand, and it is important to regulate the trade of these products and raise public awareness about the risks of use without professional supervision and guidance.

DOI: 10.1016/j.transproceed.2024.05.003

PMID: 38969610

10. **Artemisinin-induced cholestatic liver injury and intrahepatic ductopenia.** Thio J, Haig A, Swe EPP, Nguyen P, Tran K, Kasi M.

Oxf Med Case Reports. 2024 Jul 13;2024(7):omae070.

Artemisinin, an ancient Chinese herbal remedy known colloquially as "Qinghao", is now used as treatment for malaria as recommended by the World Health Organisation. There have been few reports of artemisinin-induced liver injury. Most of these instances of hepatotoxicity are reportedly due to prolonged use of herbal remedies containing artemisinin. To our knowledge, we report the first case of intrahepatic ductopenia in a patient with cholestatic liver injury after artemisinin use.

DOI: 10.1093/omcr/omae070

PMCID: PMC11246553

PMID: 39006507\

11. **Drug-induced liver injury associated to red yeast rice.** García-García MD, Bellido Muñoz F, Cordero Ruiz P, Fernández Álvarez P, Carmona Soria MI, Caunedo Álvarez Á.

Rev Esp Enferm Dig. 2024 Jul;116(7):384-385

Hepatotoxicity is defined as a liver injury induced by a drug or a non-pharmacological agent like herbal medications or dietary supplements. Red yeast rice is rich in monacolin K, which has the same chemical structure as lovastatin, reason why it has been used for the management of hyperlipidemia. A 62 years old woman presented to the emergency service with 38.5°C fever, coluric orine and loss of weight in the previous 3 weeks. The patient was taking RYR since the week before to the initial symptoms. Mixed hepatocellular and cholestatic acute hepatitis was diagnosed. Autoimmune liver serology resulted positive. Total DILI RECAM Score was 8 (highly probable DILI). Conservative treatment with exclusion of RYR was decided and during follow-up bilirubin and transaminases gradually dropped off. It has been reported a few cases of hepatitis associated to the use of RYR, promoted by a toxic or immunogenic metabolite. Cross-reactions may justify positive autoantibodies so hepatotoxicity should not be discard as a diagnose.

DOI: 10.17235/reed.2023.9797/2023

PMID: 37449514 [Indexed for MEDLINE]

12. **Turmeric-induced Liver Injury.** Alghzawi F, Jones R, Haas CJ.

J Community Hosp Intern Med Perspect. 2024 May 7;14(3):55-59. doi: 10.55729/2000-9666.1332. eCollection 2024.

The use of herbal and dietary supplements has gained an increasing foothold in the United States. While often touted as safer alternatives to more traditional "western" therapeutics, the pharmacology and pharmacokinetics of these substances, their interactions with other medications, their purity, and individual pharmacogenomics, remain unknown. Turmeric is a popular supplement that has been demonstrated to be safe, and even hepatoprotective. Recently, however, there have been several reports of turmeric-induced liver injury. We

report a case of drug-induced liver injury due to turmeric that was complicated by acute liver failure and hepatorenal syndrome.

DOI: 10.55729/2000-9666.1332

PMCID: PMC11259472

PMID: 39036565

- 13. Comparison on the mechanism and potency of hepatotoxicity among hemp extract and its four major constituent cannabinoids.** Gao X, Campasino K, Yourick MR, Zhao Y, Sepehr E, Vaught C, Sprando RL, Yourick JJ.

Toxicology. 2024 Aug;506:153885. doi: 10.1016/j.tox.2024.153885. Epub 2024 Jul 14.

Cannabidiol (CBD) has been reported to induce hepatotoxicity in clinical trials and research studies; however, little is known about the safety of other nonintoxicating cannabinoids. New approach methodologies (NAMs) based on bioinformatic analysis of high-throughput transcriptomic data are gaining increasing importance in risk assessment and regulatory decision-making of data-poor chemicals. In the current study, we conducted a concentration response transcriptomic analysis of hemp extract and its four major constituent cannabinoids [CBD, cannabichromene (CBC), cannabigerol (CBG), and cannabinol (CBN)] in hepatocytes derived from human induced pluripotent stem cells (iPSCs). Each compound impacted a distinctive combination of biological functions and pathways. However, all the cannabinoids impaired liver metabolism and caused oxidative stress in the cells. Benchmark concentration (BMC) analysis showed potencies in transcriptional activity of the cannabinoids were in the order of CBN > CBD > CBC > CBG, consistent with the order of their cytotoxicity IC<sub>50</sub> values. Patterns of transcriptomic changes induced by hemp extract and its median overall BMC were very similar to CBD but differed significantly from other cannabinoids, suggesting that potential adverse effects of hemp extract were largely due to its major constituent CBD. Lastly, transcriptomic point-of-departure (tPoD) values were determined for each of the compounds, with the value for CBD (0.106 μM) being concordant with a previously reported one derived from apical endpoints of clinical and animal studies. Taken together, the current study demonstrates the potential utility of transcriptomic BMC analysis as a NAM for hazard assessment of data-poor chemicals, improves our understanding of the possible health effects of hemp extract and its constituent cannabinoids, and provides important tPoD data that could contribute to inform human safety assessment of these cannabinoid compounds.

DOI: 10.1016/j.tox.2024.153885

PMID: 39004335 [Indexed for MEDLINE]

- 14. Drug-Induced Liver Injury in Latin America: 10-year experience of the Latin American DILI (LATINDILI) Network Drug-induced liver injury in Latin America.** Bessone F, Hernandez N, Medina-Caliz I, García-Cortés M, et al

Clin Gastroenterol Hepatol. 2024 Jul 9:S1542-3565(24)00605-0. doi: 10.1016/j.cgh.2024.06.030. Online ahead of print.

**BACKGROUND AND AIMS:** Latin America is a region of great interest for studying the clinical presentation of idiosyncratic drug-induced liver injury (DILI). A comprehensive analysis of patients enrolled into the LATINDILI Network over a decade is presented. **METHODS:** Demographics, clinical presentation, histological findings and outcome of

prospectively recruited DILI cases in the LATINDILI Network were analyzed. Suspected culprit drugs were classified according to the Anatomical Therapeutic Chemical classification. Causality was assessed using the Roussel Uclaf Causality Assessment Method (RUCAM) scale. RESULTS: Overall, 468 idiosyncratic DILI cases were analyzed (62% women, mean age 49 years). Hepatocellular injury predominated (62%), jaundice was present in 60% of patients and 42% were hospitalized. 4.1% of the cases had a fatal outcome, and 24 (12%) patients developed chronic DILI. The most common drug classes were systemic anti-infectives (31%), musculoskeletal agents (12%), antineoplastic and immunomodulating agents (11%), and herbal and dietary supplements (HDS, 9%). Notably, none of the patients with DILI due to antibacterials or immunosuppressants had a fatal outcome. In fact, Hy's law showed to have drug-specific predictive value, with anti-tuberculosis drugs, nimesulide and HDS associated with the worst outcome, whereas DILI caused by amoxicillin-clavulanate, nitrofurantoin and diclofenac that fulfilled Hy's law did not have a fatal outcome. CONCLUSION: Features of DILI in Latin America are comparable to other prospective registries. However, the pattern of drugs responsible for DILI differs. An increasing incidence of HDS, with high mortality rate, and likewise nimesulide and nitrofurantoin was noted. Thus, public health policies should raise awareness of the potential adverse effects of these compounds.

DOI: 10.1016/j.cgh.2024.06.030  
PMID: 38992407

**15. Aristolochic Acid Exposure via Dermal Contact or Inhalation of Herbal Powders: Evidence of Occupational Exposure in Herbalists with Urothelial Cancer.** Kwok HC, Chan W.

Chem Res Toxicol. 2024 Jun 17;37(6):873-877.

Emerging evidence showing urothelial cancer in herbalists is linked to aristolochic acid (AA) exposure; however, the exposure pathway remains unclear. Here, we show that dermal contact and inhalation of fine powders of AA-containing herbs are significant occupational AA exposure pathways for herbalists. We initiated the study by quantifying the amount of AA in the AA-containing powder deposited on gloves and face masks worn by the operators of an AA-containing herb grinding machine. Then, we measured the kinetics of dermal absorption and dissolution of AA from fine powders of AA-containing herbs into artificial sweat and surrogate lung fluid. Lastly, we quantified the mutagenic AA-DNA adduct levels formed in the kidneys of mice exposed to AA-containing fine powders through dermal contact. Our findings highlight an urgent occupational risk that should demand implementation of safety standards for herbalists exposed to AA-containing fine powders.

DOI: 10.1021/acs.chemrestox.4c00157  
PMID: 38780306 [Indexed for MEDLINE]

16. **Renal toxicity of Aconitum plants? A study based on a new mass spectrometry scanning strategy and computer virtual screening.** Yin Y, Zhang K, Qi Y, Li S, Sun Y, Luo M, Fan J, Zhu B, Yu Z, Yang J, Li F, Xu W, Dong L.

Phytochem Anal. 2024 Jun 5. doi: 10.1002/pca.3372. Online ahead of print.

**BACKGROUND:** Radix Aconiti Lateralis (Fuzi), a mono-herbal preparation of Aconitum herbs in the genus Aconitum, is commonly used in traditional Chinese medicine (TCM) to treat critical illnesses. The curative effect of Fuzi is remarkable. However, the toxic effects of Fuzi are still a key clinical focus, and the substances inducing nephrotoxicity are still unclear. Therefore, this study proposes a research model combining "in vitro and in vivo component mining-virtual multi-target screening-active component prediction-literature verification" to screen potential nephrotoxic substances rapidly.**METHOD:** The UHPLC-Q-Exactive-Orbitrap MS analysis method was used for the correlation analysis of Fuzi's in vitro-in vivo chemical substance groups. On this basis, the key targets of nephrotoxicity were screened by combining online disease databases and a protein-protein interaction (PPI) network. The computer screening technique was used to verify the binding mode and affinity of Fuzi's components with nephrotoxic targets. Finally, the potential material basis of Fuzi-induced nephrotoxicity was screened.

**RESULTS:** Eighty-one Fuzi components were identified. Among them, 35 components were absorbed into the blood. Based on the network biology method, 21 important chemical components and three potential key targets were screened. Computer virtual screening revealed that mesaconine, benzoyleaconine, aconitine, deoxyaconitine, hyaconitine, benzoylhyaconine, enzoylemesaconine, and hyaconitine may be potential nephrotoxic substances of Fuzi.

**CONCLUSIONS:** Fuzi may interact with multiple components and targets in the process of inducing nephrotoxicity. In the future, experiments can be designed to explore further. This study provides a reference for screening Fuzi nephrotoxic components and has certain significance for the safe use of Fuzi.

DOI: 10.1002/pca.3372

PMID: 38837823

17. **Herbal Supplement Use Among Adolescent and Young Adult Women in a Family Planning Clinic.** Friedman JC, Sheeder J, Polotsky AJ, Lazowitz A.

J Pediatr Adolesc Gynecol. 2024 Jun;37(3):323-329

**STUDY OBJECTIVE:** We aimed to evaluate herbal medicine and supplement use patterns among adolescent and young adult women at a clinic focused on family planning.

**METHODS:** We conducted a cross-sectional survey of patients (age 14-25) at an adolescent Title X clinic. Participants completed an electronic survey that assessed herbal medicine and supplement use, baseline demographic characteristics, and current contraceptive method. We evaluated supplement-drug interactions using the Natural Medicines database Interaction Checker. Quantitative analyses were performed using  $\chi^2$  and independent medians tests.



**RESULTS:** We enrolled 99 participants with a median age of 20 (15-24) years. Overall, 42.4% of patients reported ever having used supplements or herbal medicines, with 29.9% of patients reporting current supplement or herbal medicine use. Patients with higher education and private insurance were more likely to report a history of and current supplement use ( $P < .05$ ). The most common herbal supplements reported were green tea ( $n = 26$ ), cannabidiol ( $n = 17$ ), and cranberry ( $n = 16$ ), with 29.6% of participants reporting use to their general health care provider. The most common reasons for use were general health and wellness (29.1%), immune support (23.2%), stress (16.8%), and menstrual irregularities (6.0%). We found 62 moderate risk supplement-drug interactions, with 50 interactions attributed to hormonal contraceptive therapies. The most common interactions were via cytochrome P450 enzyme (CYP3A4 or CYP1A2) inhibition, decreased caffeine clearance, and potential hepatotoxicity.

**CONCLUSION:** Adolescent and young adult women frequently reported past and current herbal medicine and supplement use, with high rates of moderate-risk supplement-drug interactions. Further research is needed to better elucidate these clinically relevant supplement-contraception interactions.

DOI: 10.1016/j.jpap.2023.11.012

PMID: 38061680 [Indexed for MEDLINE]

**18. Determination of Veratrum alkaloid contents in three Veratrum species by HPLC-MS/MS.** Siegle J, Pietsch J.

Phytochem Anal. 2024 Jun 11. doi: 10.1002/pca.3401. Online ahead of print.

**INTRODUCTION:** Veratrum alkaloids have gained attention due to their toxic effects and potential pharmaceutical applications, particularly in cancer and cardiology. Over 200 alkaloids are found in species of the Veratrum genus. The alkaloid composition and concentrations can greatly vary in plants depending on factors like species, plant part, location, season, weather, or nutrients.**OBJECTIVE:** This study aims an analytical approach to analyze and quantify Veratrum alkaloids in different plant parts of Veratrum species. The purpose is to contribute essential alkaloid concentration data for future research on the pharmacological and toxicological aspects of Veratrum alkaloids.**METHODS:** This study focuses on five Veratrum alkaloids (cevadine, jervine, protoveratrine A, veratramine, and veratridine) in three Veratrum species (Veratrum album L., Veratrum californicum Durand, and Veratrum nigrum L.) collected from four German botanical gardens (Dresden, Leipzig, Marburg, and Schellerhau). A liquid-liquid extraction method and a sensitive high-performance liquid chromatography coupled with tandem mass spectrometry (HPLC-MS/MS) method operating in multiple reaction monitoring (MRM) mode were applied for the alkaloid determination.

**RESULTS:** Quantification revealed varying alkaloid concentrations among plant parts and Veratrum species in the  $\mu\text{g/g}$  to  $\text{mg/g}$  range. Protoveratrine A exhibited the highest content, while veratramine concentrations were generally lower. Especially in fruit, roots and rootstock of Veratrum album L. alkaloid concentrations were significant high.

**CONCLUSION:** The developed HPLC-MS/MS method successfully determined Veratrum alkaloid concentrations in plant samples. The study contributes valuable data on Veratrum

alkaloid distribution in different species and plant parts, crucial for understanding their potential medicinal and toxicological significance.

DOI: 10.1002/pca.3401

PMID: 38863228

19. **Rhabdomyolysis and acute kidney injury after consumption of black seed oil.** Sener K, Cakir A, Yesiloglu O, Altug E, Guven R, Korkut S.

Toxicon. 2024 Jul;245:107787. doi: 10.1016/j.toxicon.2024.107787. Epub 2024 Jun 4.

**PURPOSE:** Medicines derived from natural sources have been used for thousands of years throughout the world. Because natural compounds are thought to have less toxic effects and fewer side effects, these products are becoming more popular by the day.

**CASE REPORT:** In this case report, we presented a case of acute kidney injury, rhabdomyolysis, and hepatotoxicity after ingestion of black seed oil. Although black seed oil is widely used around the world, there is currently limited knowledge on its adverse effects.

**CONCLUSION:** It is important to keep in mind that rhabdomyolysis, acute renal damage, and hepatotoxicity might occur following the use of black seed oil. Black seed oil ingestion should be considered when making a differential diagnosis for these conditions in patients suspected of taking herbal products.

DOI: 10.1016/j.toxicon.2024.107787

PMID: 38844000 [Indexed for MEDLINE]

20. **Psychosis With Use of an Herbal Chinese Slimming Product.** Rao M, Riney M, Shah K, Kimball J, Munjal S.

Prim Care Companion CNS Disord. 2024 Jun 11;26(3):23cr03590. doi: 1.4088/PCC.23cr03590.

Sibutramine was previously used in the United States and Europe for long-term obesity management. However, in 2010, the drug was discontinued in the United States due to an increased risk of cardiovascular events in patients with a history of heart attacks and strokes. Psychiatric side effects such as panic attacks, depression, mania, and, in some circumstances, psychosis were reported.<sup>3</sup> Nevertheless, sibutramine remained a key ingredient in several Chinese herbal weight loss products in the United States. Some case reports suggest that an underlying bipolar disorder may be present for psychotic features to occur in a person taking these weight loss pills. However, we present a case of psychosis in a patient taking a Chinese herbal appetite suppressant who did not have an underlying mood disorder or abnormal laboratory and urine drug screen results that could cause psychiatric symptoms.

DOI: 10.4088/PCC.23cr03590

PMID: 38875107 [Indexed for MEDLINE]

21. **Analyzing Potential Interactions Between Complementary and Alternative Therapies, Over-the-Counter, and Prescription Medications in the Older Population.** Jaqua EE, Gonzalez J, Bahjri K, Erickson S, Garcia C, Santhavachart M, Nguyen V, Labib W, Abdrabou R.

Perm J. 2024 Jun 14;28(2):70-77. doi: 10.7812/TPP/23.183. Epub 2024 Jun 6.

**BACKGROUND:** The escalating use of complementary and alternative medicine (CAM) raises concerns, particularly among geriatric patients taking multiple medications. Notably, the doubled chance of major drug interactions between prescription and over-the-counter (OTC) drugs in older adults underscores the need for further research. This study aimed to evaluate clinically significant CAM and prescription medication interactions in a geriatric clinic, emphasizing the growing importance of understanding CAM implications in health care. **METHODS:** A 2-year cross-sectional study, approved by the Institutional Review Board, enrolled 420 participants aged 65 and older from a geriatric primary care clinic. Participants completed a survey, and pharmacy students conducted chart reviews to evaluate potential CAM products and prescription medication interactions.

**RESULTS:** Among the 420 participants—who were predominantly White females and who were taking supplements, OTC medications, or both—15.6% experienced potential drug interactions. Ginkgo biloba, garlic, and calcium were common contributors to major, moderate, and minor interactions, respectively, among supplements. Meanwhile, ibuprofen was among the contributors to major and moderate interactions among OTC medications. Most supplements and OTC medications were disclosed to health care professionals. However, there was a lack of investigation by health care professionals regarding CAM use, emphasizing a discrepancy between patient-reported and physician-inquired CAM usage. **CONCLUSION:** This study highlighted the significant use of CAM and/or OTC medications, particularly among vulnerable older adults, revealing a concerning 15.6% rate of potential drug interactions. The findings emphasized the need for awareness among health care practitioners and standardized CAM surveys to enhance accuracy and patient safety.

DOI: 10.7812/TPP/23.183

PMCID: PMC11232911

PMID: 38980791 [Indexed for MEDLINE]

22. **Mass spectrometric analysis strategies for pyrrolizidine alkaloids.** Chen Y, Li L, Xu J, Liu Y, Xie Y, Xiong A, Wang Z, Yang L.

Food Chem. 2024 Jul 1;445:138748. doi: 10.1016/j.foodchem.2024.138748.

Pyrrolizidine alkaloids (PAs) in food and natural preparations have received widespread attention due to their hepatotoxicity, genotoxicity, and embryotoxicity. Mass spectrometry (MS), as a high resolution, high sensitive, and high throughput detection tool, has been the most commonly used technique for the determination of PAs. The continuous advancement of new technologies, methods, and strategies in the field of MS has contributed to the improvement of the analytical efficiency and methodological enhancement of PAs. This paper provides an overview of the structure, toxicity properties and commonly employed analytical methods, focusing on the concepts, advances, and novel techniques and

applications of MS-based methods for the analysis of PAs. Additionally, the remaining challenges, future perspectives, and trends for PA detection are discussed. This review provides a reference for toxicological studies of PAs, content monitoring, and the establishment of quality control and safety standards for herbal and food products.

DOI: 10.1016/j.foodchem.2024.138748  
PMID: 38422865 [Indexed for MEDLINE]

23. **Cushing syndrome because of herbal supplement.** Krul-Poel YHM, Bovee TFH, Fransen EJF, Berentsen R, Deckers MML, de Bie P.

Ned Tijdschr Geneeskd. 2024 Jun 27;168:D8053.

The use of exogenous glucocorticoids is a common cause of Cushing syndrome. We present a case of exogenous Cushing syndrome caused by Binahong: an over-the-counter 'herbal' supplement. A 54-year-old woman presented with weight gain, joint pain, hypertension and poorly regulated type 2 diabetes mellitus despite the start of semaglutide one year before presentation. Physical examination revealed signs of steroid excess with a moon face and abdominal obesity. Her serum cortisol level and ACTH level were suppressed. Synthetic glucocorticoid screening revealed a positive dexamethason level in the herbal supplement. After stopping the supplement her serum cortisol and dexamethason increased to normal levels. This case emphasizes the importance of awareness for the use of supplements containing hidden glucocorticoids causing Cushing syndrome.

PMID: 38989679 [Indexed for MEDLINE]

24. **Herbal remedies as a potential cause of hypoadrenalism.** Patel M, Newell R, Hillier M, Ramalingam R.

Br J Hosp Med (Lond). 2024 Jun 30;85(6):1-4. doi: 10.12968/hmed.2024.0038. Epub 2024 Jun 14.

A 37-year-old woman presented with nausea, vomiting and headache. She was found to be profoundly hyponatraemic with a sodium of 121 mmol/L, which deteriorated following a fluid challenge. An initial hyponatraemia screen identified adrenal insufficiency, with cortisol of 48 nmol/L. History confirmed she had been taking the herbal plant, ashwagandha. After 3 days of fluid restriction and steroid replacement, her sodium returned to normal (139 mmol/L). This article reviews the possible harmful effects of over-the-counter herbal remedies and highlights the importance of considering a wide differential diagnosis in patients presenting with non-specific symptoms.

DOI: 10.12968/hmed.2024.0038  
PMID: 38941978 [Indexed for MEDLINE]