AACT Herbal Dietary Supplement Section Abstracts May 2023

1. Trends in Emergency Department Visits for Unsupervised Pediatric Medication Exposures. Lovegrove MC, Weidle NJ, Geller AI, Lind JN, Rose KO, Goring SK, Budnitz DS.

Am J Prev Med. 2023 Jun;64(6):834-843. doi: 10.1016/j.amepre.2023.01.011. Epub 2023 Apr 20.

INTRODUCTION: Emergency department visits and hospitalizations for unsupervised medication exposures among young children increased in the early 2000s. Prevention efforts were initiated in response. METHODS: Nationally representative data from the National Electronic Injury Surveillance System-Cooperative Adverse Drug Event Surveillance project collected from 2009 to 2020 were analyzed in 2022 to assess overall and medication-specific trends in emergency department visits for unsupervised exposures among children aged ≤5 years. RESULTS: From 2009 to 2020, there were an estimated 677,968 (95% CI=550,089, 805,846) emergency department visits for unsupervised medication exposures among children aged ≤5 years in the U.S. Most visits involved children aged 1-2 years (2009-2012 [70.3%], 2017-2020 [67.4%]), and nearly one half involved prescription solid medications (2009-2012 [49.4%], 2017-2020 [48.1%]). The largest declines in estimated numbers of annual visits from 2009-2012 to 2017-2020 were for exposures involving prescription solid benzodiazepines (-2,636 visits, -72.0%) and opioids (-2,596 visits, -53.6%) and over-the-counter liquid cough and cold medications (-1,954 visits, -71.6%) and acetaminophen (-1,418 visits, -53.4%). The estimated number of annual visits increased for exposures involving over-the-counter solid herbal/alternative remedies (+1,028 visits, +65.6%), with the largest increase for melatonin exposures (+1,440 visits, +421.1%). Overall, the estimated number of visits for unsupervised medication exposures decreased from 66,416 in 2009 to 36,564 in 2020 (annual percentage change= -6.0%). Emergent hospitalizations for unsupervised exposures also declined (annual percentage change= -4.5%). CONCLUSIONS: Declines in estimated emergency department visits and hospitalizations for unsupervised medication exposures from 2009 to 2020 coincided with renewed prevention efforts. Targeted approaches may be needed to achieve continued declines in unsupervised medication exposures among young children.

DOI: 10.1016/j.amepre.2023.01.011
PMID: 37210158 [Indexed for MEDLINE]

2. Curcumin, a dietary natural supplement, prolongs the action potential duration of KCNE1-D85N-induced pluripotent stem cell-derived cardiomyocytes. Martinez K, Smith A, Ye D, Zhou W, Tester DJ, Ackerman MJ.

Heart Rhythm. 2023 Apr;20(4):580-586. doi: 10.1016/j.hrthm.2022.12.034. Epub 2022 Dec 28.

BACKGROUND: Curcumin, a polyphenolic dietary natural compound and active ingredient in turmeric, exerts antioxidant, anti-inflammatory, antidiabetic, anticancer, and antiarrhythmic properties. KCNE1-D85N, present in ~1% of white, is a common, potentially proarrhythmic variant that predisposes individuals to drug-induced QT prolongation under certain conditions. OBJECTIVE: The purpose of this article was to test the hypothesis that curcumin might cause action potential duration (APD) prolongation in KCNE1-D85N-derived human-induced pluripotent stem cell-derived cardiomyocytes (iPSC-CMs). METHODS: Gene-edited/variant-corrected isogenic control and patient-specific KCNE1-D85N-containing iPSC-CMs were generated previously. Voltage-sensing dye, multielectrode array (MEA), and whole-cell patch clamp technique were used to measure APD without and with 4-hour incubation with 10 nM curcumin. RESULTS: KCNE1-D85N-derived iPSC-CMs demonstrated significant APD prolongation with treatment of 10 nM curcumin. Using voltage-sensing dye, action potential duration at 90% repolarization (APD90) was 578 ± 7 ms (n = 39) at baseline and was prolonged to 658 ± 13 ms (n = 35) with curcumin incubation (P < .0001). Using MEA, APD90 at baseline was 237 ± 6 ms (n = 24) compared with 280 ± 6 ms (n = 12) with curcumin incubation (P = .0002). The whole-cell patch clamp technique confirmed these results, with APD90 being 544 ± 37 ms at baseline and 664 ± 40 ms with treatment of curcumin (P < .005). However, APD from isogenic control iPSC-CMs remained unchanged with curcumin treatment. CONCLUSION: This study provides pharmacological and functional evidence to suggest that curcumin, a dietary natural supplement,

might cause APD prolongation in patients with common, potentially proarrhythmic functional variants such as KCNE1-D85N. Whether this supplement is potentially dangerous for the Caucasian subpopulation that has this variant warrants further investigation.

DOI: 10.1016/j.hrthm.2022.12.034
PMID: 36586707 [Indexed for MEDLINE]

3. On the q.t. no more: Exposing the arrhythmic risks of dietary supplements. Roston TM

Heart Rhythm. 2023 Apr;20(4):587-588. doi: 10.1016/j.hrthm.2023.01.028. Epub 2023 Jan 27.

Comment on
Heart Rhythm. 2023 Apr;20(4):580-586.

DOI: 10.1016/j.hrthm.2023.01.028
PMID: 36717010 [Indexed for MEDLINE]

4**. Assay for evaluation of proarrhythmic effects of herbal products: Case study with 12 Evodia preparations.** Baltov B, Beyl S, Baburin I, Reinhardt J, Szkokan P, Garifulina A, Timin E, Kraushaar U, Potterat O, Hamburger M, Kügler P, Hering S.

Toxicol Rep. 2023 Apr 26;10:589-599. doi: 10.1016/j.toxrep.2023.04.014. eCollection 2023.

Guidelines for preclinical drug development reduce the occurrence of arrhythmia-related side effects. Besides ample evidence for the presence of arrhythmogenic substances in plants, there is no consensus on a research strategy for the evaluation of proarrhythmic effects of herbal products. Here, we propose a cardiac safety assay for the detection of proarrhythmic effects of plant extracts based on the experimental approaches described in the Comprehensive In vitro Proarrhythmia Assay (CiPA). Microelectrode array studies (MEAs) and voltage sensing optical technique on human induced pluripotent stem cell-derived cardiomyocytes (hiPSC-CMs) were combined with ionic current measurements in mammalian cell lines, In-silico simulations of cardiac action potentials (APs) and statistic regression analysis. Proarrhythmic effects of 12 Evodia preparations, containing different amounts of the hERG inhibitors dehydroevodiamine (DHE) and hortiamine were analysed. Extracts produced different prolongation of the AP, occurrence of early after depolarisations and triangulation of the AP in hiPSC-CMs depending on the contents of the hERG inhibitors. DHE and hortiamine dose-dependently prolonged the field potential duration in hiPSC-CMs studied with MEAs. In-silico simulations of ventricular AP support a scenario where proarrhythmic effects of Evodia extracts are predominantly caused by the content of the selective hERG inhibitors. Statistic regression analysis revealed a high torsadogenic risk for both compounds that was comparable to drugs assigned to the high-risk category in a CiPA study.

DOI: 10.1016/j.toxrep.2023.04.014
PMCID: PMC10196857
PMID: 37213814

5. Molecular mechanisms of hepatotoxicity induced by compounds occurring in Evodiae Fructus. Yan C, Peng T, Zhang T, Wang Y, Li N, Wang K, Jiang X.

Drug Metab Rev. 2023 Feb-May;55(1-2):75-93. doi: 10.1080/03602532.2023.2180027. Epub 2023 Feb 20.

Evodiae Fructus (EF) is a common herbal medicine with thousands of years of medicinal history in China, which has been demonstrated with many promising pharmacological effects on cancer, cardiovascular diseases and Alzheimer's disease. However, there have been increasing reports of hepatotoxicity associated with EF consumption. Unfortunately, in a long term, many implicit constituents of EF as well as their toxic mechanisms remain poorly understood. Recently, metabolic activation of hepatotoxic compounds of EF to generate reactive metabolites (RMs) has been implicated. Herein, we capture metabolic reactions relevant to hepatotoxicity of these compounds. Initially, catalyzed by the hepatic cytochrome P450 enzymes (CYP450s), the hepatotoxic compounds of EF are oxidized to generate RMs. Subsequently, the highly electrophilic RMs could react with nucleophilic groups contained in biomolecules, such as hepatic proteins, enzymes, and nucleic acids to form conjugates and/or adducts, leading to a sequence of toxicological consequences. In addition, currently proposed biological pathogenesis, including oxidative stress, mitochondrial damage and

dysfunction, endoplasmic reticulum (ER) stress, hepatic metabolism disorder, and cell apoptosis are represented. In short, this review updates the knowledge on the pathways of metabolic activation of seven hepatotoxic compounds of EF and provides considerable insights into the relevance of proposed molecular hepatotoxicity mechanisms from a biochemical standpoint, for the purpose of providing a theoretical guideline for the rational application of EF in clinics.

DOI: 10.1080/03602532.2023.2180027
PMID: 36803497 [Indexed for MEDLINE]

6. Clinical characteristics and prognosis of non-APAP drug-induced acute liver failure: a large multicenter cohort study. Han L, Huang A, Chen J, Teng G, Sun Y, Chang B, Liu HL, Xu M, Lan X, Liang Q, Zhao J, Tian H, Chen S, Zhu Y, Xie H, Dang T, Wang J, Li N, Wang X, Chen Y, Yang YF, Ji D, Zou Z.

Hepatol Int. 2023 May 19. doi: 10.1007/s12072-023-10541-w. Online ahead of print.

BACKGROUND: There is growing recognition of natural history, complications, and outcomes of patients who develop non-acetaminophen (APAP) drug-induced acute liver failure (ALF). To clarify high-risk factors and develop a nomogram model to predict transplant-free survival (TFS) in patients with non-APAP drug-induced ALF. METHODS: Patients with non-APAP drug-induced ALF from 5 participating centers were retrospectively analyzed. The primary endpoint was 21-day TFS. Total sample size was 482 patients. RESULTS: Regarding causative agents, the most common implicated drugs were herbal and dietary supplements (HDS) (57.0%). The hepatocellular type ($R \geq 5$) was the main liver injury pattern (69.0%). International normalized ratio, hepatic encephalopathy grades, the use of vasopressor, N-acetylcysteine, or artificial liver support system were associated with TFS and incorporated to construct a nomogram model (drug-induced acute liver failure-5, DIALF-5). The AUROC of DIALF-5 for 7-day, 21-day, 60-day, and 90-day TFS in the internal cohort were 0.886, 0.915, 0.920, and 0.912, respectively. Moreover, the AUROC of DIALF-5 for 21-day TFS had the highest AUROC, which was significantly higher than 0.725 of MELD and 0.519 of KCC ($p < 0.05$), numerically higher than 0.905 of ALFSG-PI but without statistical difference ($p > 0.05$). These results were successfully validated in the external cohort (147 patients). CONCLUSIONS: Based on easily identifiable clinical data, the novel DIALF-5 model was developed to predict transplant-free survival in non-APAP drug-induced ALF, which was superior to KCC, MELD and had a similar prediction performance to ALFSG-PI but is more convenient, which can directly calculate TFS at multiple time points.

DOI: 10.1007/s12072-023-10541-w
PMID: 37208493

7. In Vitro Hepatic Models to Assess Herb-Drug Interactions: Approaches and Challenges. N H, C M, T R M, S S, S N, K E M, S C S, Y N, P V D, R N M.

Pharmaceuticals (Basel). 2023 Mar 8;16(3):409. doi: 10.3390/ph16030409.

A newfound appreciation for the benefits of herbal treatments has emerged in recent decades. However, herbal medication production still needs to establish standardized protocols that adhere to strict guidelines for quality assurance and risk minimization. Although the therapeutic effects of herbal medicines are extensive, the risk of herb-drug interactions remains a serious concern, limiting their use. Therefore, a robust, well-established liver model that can fully represent the liver tissue is required to study potential herb-drug interactions to ensure herbal medicines' safe and effective use. In light of this, this mini review investigates the existing in vitro liver models applicable to detecting herbal medicines' toxicity and other pharmacological targets. This article analyzes the benefits and drawbacks of existing in vitro liver cell models. To maintain relevance and effectively express the offered research, a systematic strategy was employed to search for and include all discussed studies. In brief, from 1985 to December 2022, the phrases "liver models", "herb-drug interaction", "herbal medicine", "cytochrome P450", "drug transporters pharmacokinetics", and "pharmacodynamics" were combined to search the electronic databases PubMed, ScienceDirect, and the Cochrane Library.

DOI: 10.3390/ph16030409
PMCID: PMC10058280
PMID: 36986508

8. The Controversial Roles of Areca Nut: Medicine or Toxin? Liu PF, Chang YF.

Int J Mol Sci. 2023 May 19;24(10):8996. doi: 10.3390/ijms24108996.

Areca nut (AN) is used for traditional herbal medicine and social activities in several countries. It was used as early as about A.D. 25-220 as a remedy. Traditionally, AN was applied for several medicinal functions. However, it was also reported to have toxicological effects. In this review article, we updated recent trends of research in addition to acquire new knowledge about AN. First, the history of AN usage from ancient years was described. Then, the chemical components of AN and their biological functions was compared; arecoline is an especially important compound in AN. AN extract has different effects caused by different components. Thus, the dual effects of AN with pharmacological and toxicological effects were summarized. Finally, we described perspectives, trends and challenges of AN. It will provide the insight of removing or modifying the toxic compounds of AN extractions for enhancing their pharmacological activity to treat several diseases in future applications.

DOI: 10.3390/ijms24108996
PMCID: PMC10219234
PMID: 37240342 [Indexed for MEDLINE]

9. Neurotoxic risks from over-the-counter vitamin supplements. Krishnan D, Kiernan MC.

Med J Aust. 2023 Apr 17;218(7):304-306. doi: 10.5694/mja2.51851. Epub 2023 Feb 13.

no abstract

DOI: 10.5694/mja2.51851
PMID: 36780932 [Indexed for MEDLINE]

10. Aristolochic acid-containing Chinese herbal medicine and upper urinary tract urothelial carcinoma in Taiwan: a narrative review. Dickman KG, Chen CH, Grollman AP, Pu YS.

World J Urol. 2023 Apr;41(4):899-907. doi: 10.1007/s00345-022-04100-5. Epub 2022 Jul 22.

PURPOSE: The high incidence of upper urinary tract urothelial carcinoma (UTUC) in Taiwan is largely due to exposure to aristolochic acid (AA), a principal component of Aristolochia-based herbal medicines. Here we systematically review the molecular epidemiology, clinical presentation and biomarkers associated with AA-induced UTUC. METHODS: This is a narrative review. Medline, Embase, and Web of Science were searched from inception to December 31, 2021. Studies evaluating the association, detection, and clinical characteristics of AA and UTUC were included. RESULTS: A nationwide database revealed 39% of the Taiwanese population had been exposed to AA-containing herbs between 1997 and 2003. Epidemiological reports revealed AA posed a significantly higher hazard for renal failure and UTUC in herbalists and the general population who ingested AA-containing herbs. The presence of aristolactam-DNA adducts and a distinctive signature mutation, A:T to T:A transversions, located predominantly on the non-transcribed DNA strand, with a strong preference for deoxyadenosine in a consensus sequence (CAG), was observed in many UTUC patients. Clinically, AA-related UTUC patients were characterized by a younger age, female gender, impaired renal function and recurrence of contralateral UTUC. To date, there are no preventive measures, except prophylactic nephrectomy, for subjects at risk of AA nephropathy or AA-related UTUC. CONCLUSION: AA exposure via Aristolochia-based herbal medicines is a problem throughout Taiwan, resulting in a high incidence of UTUC. Aristolactam-DNA adducts and a distinctive signature mutation, A:T to T:A transversions, can be used as biomarkers to identify AA-related UTUC. AA-related UTUC is associated with a high recurrence rate of contralateral UTUC.

DOI: 10.1007/s00345-022-04100-5
PMID: 35867141 [Indexed for MEDLINE]

11. Elementary Overview of Heavy Metals. Jannetto PJ, Cowl CT.

Clin Chem. 2023 Apr 3;69(4):336-349. doi: 10.1093/clinchem/hvad022.

BACKGROUND: Exposure to heavy metals is common as a result of environmental contamination of air, water, and soil as well as accumulation in food, tobacco, herbal medicines, and occupational contact. However, clinically relevant toxicity is much less prevalent. Toxic effects, when they occur, may present with non-specific symptoms, resulting in a very large differential for clinicians to consider. CONTENT: Arsenic, cadmium, lead, and mercury are four heavy metals with no biological role in humans. However, these metals are commonly used in industrial applications and consumer products. Since these elements are not biodegradeable, their potential toxic effects may be long-lasting within the environment. These heavy metals have the potential to accumulate in vital organs such as the brain, heart, and kidney where they may disrupt normal cellular functioning and if exposures are repetitive or of high concentration, toxicity may result. SUMMARY: The objective of this review is to provide an overview of arsenic, cadmium, lead, and mercury physical properties, common sources of exposure, basic toxicokinetics and health effects, and to review clinical guidelines and treatment strategies. Acute and chronic symptoms and recommended laboratory biomarker testing are also discussed.

DOI: 10.1093/clinchem/hvad022
PMID: 36945128 [Indexed for MEDLINE]

12. Immune-mediated herb-induced liver injury: a potential association with herbal artemisinin use as supported by the updated RUCAM. Mathavan A, Mathavan A, Krekora U, Daily K.

BMJ Case Rep. 2023 May 4;16(5):e251852. doi: 10.1136/bcr-2022-251852.

Immune-mediated herb-induced liver injury (HILI) is an acute or chronic inflammatory liver disease precipitated by a hepatotoxic agent with a presentation similar to acute autoimmune hepatitis. It is distinguished in clinical course from true autoimmune hepatitis by remission on drug discontinuation and immunosuppressive treatment. We report a potential case of immune-mediated HILI associated with artemisinin use, an herb underlying first-line malarial treatments, in a woman undergoing radiotherapy for right-sided pelvic sarcoma. A probable association in this case is supported by causality assessment using the updated Roussel Uclaf Causality Assessment Method (score of 6). She achieved clinical improvement with a course of oral corticosteroids and remained stable without relapse following discontinuation. Increased awareness of this complication is imperative, as literature to date only documents direct hepatocellular and cholestatic liver injury from artemisinin use, and should augment clinician counsel regarding complementary medicine administration, especially in high-risk individuals like those with cancer.

DOI: 10.1136/bcr-2022-251852
PMCID: PMC10163430
PMID: 37142282 [Indexed for MEDLINE]

13. A Case of Acute Liver Failure Due to Artemisinin-Derived Herbal Supplements. Jamil M, Salam A, Joseph Benher B, Nasiri N, Chaudhary AJ.

Cureus. 2023 Mar 23;15(3):e36582. doi: 10.7759/cureus.36582. eCollection 2023 Mar.

A 49-year-old female presented with malaise, nausea, vomiting, and discolored urine. She was found to have an acute liver failure with labs significant for aspartate aminotransferase (AST) of 2164, alanine aminotransferase (ALT) of 2425, alkaline phosphatase (ALP) of 106, total bilirubin of 3.6, and lactate dehydrogenase (LDH) of 2269. The international normalized ratio (INR) was also elevated at 1.9. All workup for acute liver failure was negative and it was found that she had started taking a new supplement called "Gut Health", which contained artemisinin, for weight loss and menopausal symptoms. After discontinuing the supplements and symptomatically treating her for acute liver failure, her transaminitis resolved.

DOI: 10.7759/cureus.36582
PMCID: PMC10122439
PMID: 37095792

14. Drug-Induced Liver Injury Secondary to Turmeric Use. Ajitkumar A, Mohan G, Ghose M, Yarrarapu S, Afiniwala S.

Eur J Case Rep Intern Med. 2023 Apr 21;10(5):003845. doi: 10.12890/2023_003845. eCollection 2023.

Turmeric is a herbal medication and spice which has been used for thousands of years in traditional Eastern medicine for its flavour, colour, and purported anti-inflammatory, antioxidant, antineoplastic and antimicrobial properties. It has recently garnered interest and popularity worldwide for these reasons. While turmeric supplements are generally safe, some reports of toxicity are emerging. Compounds like piperine are added to turmeric to enhance its bioavailability, potentially contributing to its toxicity. Here, we describe a 55-year-old woman with progressive jaundice and elevated bilirubin and liver enzymes but no evidence of acute liver failure. She was treated with N-acetyl cysteine (NAC) for 24 hours and liver function tests (LFTs) were closely monitored. As a downtrend in LFTs was noted and the patient remained asymptomatic, she was discharged with close outpatient follow-up. LFTs eventually normalized 2 months after the initial presentation. Clinicians must keep this differential in mind when evaluating acute liver injury. With our case report, we question the utility of NAC in non-acetaminophen-related liver injury and encourage further studies. LEARNING POINTS: Eliciting information on recent drug or supplement use should be part of comprehensive history-taking to evaluate acute liver injury.Turmeric supplements which may contain piperine to enhance bioavailability are a potential source of acute liver injury.The role of N-acetyl cysteine in managing non-acetaminophen-related liver injury is unclear and further studies are required.

DOI: 10.12890/2023_003845
PMCID: PMC10187097
PMID: 37205206

15. Kratom-induced acute liver injury: A case study and the importance of herbal supplement regulation. Roma K, Mohammed S, Sieck B, Naik K, Wahid S.

J Hepatol. 2023 Apr 28:S0168-8278(23)00311-2. doi: 10.1016/j.jhep.2023.04.026. Online ahead of print.

Alternative medicine supplements have become the second most common cause of drug-induced liver injury (DILI) in the US. Kratom is a herbal supplement that is popular for its psychotropic and opioid-like activity. It has become increasingly available in western countries, which often have no specific regulations on its use. However, reports of adverse events linked to kratom use have been increasing; it has been implicated in acute liver injury (mostly cholestatic), acute liver failure, organ dysfunction, toxicity, coma, seizures, and death. Herein, we aim to increase healthcare provider and public awareness of the risks posed by kratom and ultimately support increased regulation of its use.

DOI: 10.1016/j.jhep.2023.04.026
PMID: 37121435

16. A Case Report of Acute Hepatitis Involving the Medicinal Herb Tinospora cordifolia Along with Other Variables. May K, Jeitler M, Murthy V, Stapelfeldt E, Kessler CS.

J Integr Complement Med. 2023 May;29(5):327-333. doi: 10.1089/jicm.2022.0755. Epub 2023 Mar 17.

This is a 54-year-old woman from Germany of central European origin who developed an acute hepatitis while orally taking Ayurvedic herbal remedies, among those was the medicinal herb Tinospora cordifolia. She took the plant powders from July 1, 2021, to October 1, 2021, with the intention of relieving the symptoms of her subjectively irritated gastrointestinal tract. The patient's main symptoms of acute hepatitis were progressively increasing general fatigue, nausea, and exhaustion. During an inpatient hospital admission from November 4, 2021, to November 9, 2021, she was under clinical observation, but no specific therapeutic measures were deemed necessary; however, blood chemistry showed an acute toxic hepatitis. There was no clinical or laboratory evidence of acute liver failure. Aminotransferase values decreased to normal values on December 14, 2021, by themselves. This case report contributes to the ongoing discussion about the potential risks of triggering an acute hepatitis due to the intake of herbal remedies from the Tinospora genus in rare cases, differentiating other involved risk factors. The case also shows that causality assignments are not trivial in the context of multivariate clinical scenarios. In the case of known hepatic metabolism-associated risk factors, T. cordifolia should be used with more caution based on available case reports. At the same time, no hasty and exaggerated prejudgments should be made about this medicinal herb, which has been very successfully used in traditional South Asian systems of medicine for many centuries.

DOI: 10.1089/jicm.2022.0755
PMID: 36930784 [Indexed for MEDLINE]

17.Acute Hepatitis Associated with Intake of Pistacia Vera L. Bud Tea; a Case Report. Altınsoy KE, Oktay MM.

Arch Acad Emerg Med. 2023 Apr 29;11(1):e35. doi: 10.22037/aaem.v11i1.2006. eCollection 2023.

In this study, a patient who developed acute hepatitis due to drinking Pistacia vera L. bud tea is presented. A twenty-eight-year-old woman who had just come out of the postpartum period applied to our clinic with complaints of nausea, vomiting, loss of appetite and weakness. Blood serum alanine aminotransferase and aspartate aminotransferase levels were increased. All serological tests were negative for viral hepatitis and autoimmune diseases. She had been drinking an herbal tea containing Pistacia vera L. bud every day for four weeks to increase milk production. Three weeks after discontinuation of herbal tea, liver enzymes returned to normal. Based on our knowledge, this is probably the first hepatitis report due to the use of an herbal tea containing Pistacia vera L. bud.

DOI: 10.22037/aaem.v11i1.2006
PMCID: PMC10197915
PMID: 37215235

18. Rapid determination of five common toxic alkaloids in blood by UPLC-MRM-IDA-EPI: Application to poisoning case. Zhang S, Chen S, Zhu F, Wang A, Xia B, Wang J, Huang J, Liu Y, Luo P.

Leg Med (Tokyo). 2023 May 2;63:102267. doi: 10.1016/j.legalmed.2023.102267. Online ahead of print.

Toxic alkaloids are typically found in herbal medicines and have strong pharmacological effects and a broad therapeutic spectrum. On the other hand, toxic alkaloids exert toxicological activities in vivo; as such they have a narrow therapeutic window and can induce poisoning due to incorrect dose or misuse. In this view, there is an urgent need to develop a rapid and sensitive assay to detect these toxic alkaloids. This study developed a method for determining five common toxic alkaloids in blood, including brucine, strychnine, aconitine, mesaconitine, and hypaconitine using ultra-high liquid chromatography-tandem quadrupole/linear ion trap mass spectrometry (QTRAP UPLC-MS/MS). The analytes in this investigation were extracted with ether and detected using multiple reaction monitoring (MRM)-information-dependent acquisition (IDA)-enhanced product ion (EPI) scanning modes. SKF525A served as the internal standard (IS). The approach demonstrated excellent linearity, with a correlation coefficient (R) > 0.9964, and satisfactory sensitivity, with the limit of detection (LOD) of 0.31 ~ 3.26 ng/mL and a limit of quantification (LOQ) of 1.13 ~ 11.52 ng/mL. The extraction recovery (ER) was 78.8 ~ 116.2%, the matrix effect (ME) was -12.3 ~ 21.2%, and the method accuracy was 0.8 ~ 12.8%. In addition, the intra-day precision and the inter-day precision (RSD) were 0.7% ~ 7.4% and 0.4% ~ 13.5%, respectively. The developed approach is sensitive and efficient, and offer significant application prospect in clinical monitoring and forensic detection of poisoning.

DOI: 10.1016/j.legalmed.2023.102267
PMID: 37201269

19. Everyday Evaluation of Herb/Dietary Supplement-Drug Interaction: A Pilot Study. Souza-Peres JV, Flores K, Umloff B, Heinan M, Herscu P, Babos MB.

Medicines (Basel). 2023 Feb 28;10(3):20. doi: 10.3390/medicines10030020.

A lack of reliable information hinders the clinician evaluation of suspected herb-drug interactions. This pilot study was a survey-based study conceived as a descriptive analysis of real-life experiences with herb-drug interaction from the perspective of herbalists, licensed health-care providers, and lay persons. Reported dietary supplement-drug interactions were evaluated against the resources most commonly cited for the evaluation of potential supplement-drug interactions. Disproportionality analyses were performed using tools available to most clinicians using data from the U.S. Federal Adverse Event Reporting System (FAERS) and the US Center for Food Safety and Applied Nutrition (CFSAN) Adverse Event Reporting System (CAERS). Secondary aims of the study included exploration of the reasons for respondent use of dietary supplements and qualitative analysis of respondent's perceptions of dietary supplement-drug interaction. While agreement among reported supplement-drug interactions with commonly cited resources for supplement-drug interaction evaluation and via disproportionality analyses through FAERS was low, agreement using data from CAERS was high.

DOI: 10.3390/medicines10030020
PMCID: PMC10055849
PMID: 36976309

20. The tobacco-free fallacy: What paediatricians should know about herbal smoking products.
Khorasani A, Chadi N.

Paediatr Child Health. 2022 Sep 21;28(3):141-144. doi: 10.1093/pch/pxac096. eCollection 2023 Jun.

While e-cigarette and combustible cigarette use remains more common among youth, herbal smoking products are gaining interest and popularity among children and adolescents. Herbal smoking products are often touted as a safer alternative to tobacco smoking or nicotine vaping; however, research suggests that they emit significant levels of toxicants and carcinogens posing risks to child and adolescent health. The low perceived risk coupled with youth-friendly flavours and easy access may entice youth to use herbal smoking products and increase the risk of subsequent tobacco and substance use. We discuss what is known about the use, health effects, and regulations of herbal smoking products and present strategies for policymakers and paediatric providers to reduce the risks associated with these products for Canadian youth.

DOI: 10.1093/pch/pxac096
PMCID: PMC10186095
PMID: 37205137