AACT Herbal Dietary Supplements SIG Abstracts March 2018

1. Herbal and Dietary Supplement-induced Liver Injuries in the Spanish DILI Registry. Medina-Caliz I, Garcia-Cortes M, Gonzalez-Jimenez A, Cabello MR, Robles-Diaz M, Sanabria-Cabrera J, Sanjuan-Jimenez R, Ortega-Alonso A, García-Muñoz B, Moreno I, Jimenez-Perez M, Fernandez MC, Ginés P, Prieto M, Conde I, Hallal H, Soriano G, Roman E, Castiella A, Blanco-Reina E, Montes MR, Quiros-Cano M, Martin-Reyes F, Lucena MI, Andrade RJ; Spanish DILI Registry.

Clin Gastroenterol Hepatol. 2018 Jan 4. pii: S1542-3565(18)30010-7. doi: 10.1016/j.cgh.2017.12.051. [Epub ahead of print]

BACKGROUND & AIMS: There have been increasing reports of liver injury associated with use of herbal and dietary supplements, likely due to easy access to these products and beliefs among consumers that they are safer or more effective than conventional medications. We aimed to evaluate clinical features and outcomes of patients with herbal and dietary supplement-induced liver injuries included in the Spanish DILI Registry. METHODS: We collected and analyzed data on demographic and clinical features, along with biochemical parameters, of 32 patients with herbal and dietary supplement-associated liver injury reported to the Spanish DILI registry from 1994 through 2016. We used analysis of variance to compare these data with those from cases of liver injury induced by conventional drugs or anabolic androgenic steroid-containing products. RESULTS: Herbal and dietary supplements were responsible for 4% (32 cases) of the 856 DILI cases in the registry; 20 cases of DILI (2%) were caused by anabolic androgenic steroids. Patients with herbal and dietary supplement-induced liver injury were a mean age of 48 years and 63% were female; they presented a mean level of alanine aminotransferase 37-fold the upper limit of normal, 28% had hypersensitivity features, and 78% had jaundice. Herbal and dietary supplement-induced liver injury progressed to acute liver failure in 6% of patients, compared to none of the cases of anabolic androgenic steroid-induced injury and 4% of cases of conventional drugs. Liver injury after repeat exposure to the same product that caused the first DILI episode occurred in 9% of patients with herbal and dietary supplement-induced liver injury vs none of the patients with anabolic androgenic steroid-induced injury and 6% of patients with liver injury from conventional drugs. CONCLUSION: In an analysis of cases of herbal and dietary supplement-induced liver injury in Spain, we found cases to be more frequent among young women than older patients or men, and to associate with hepatocellular injury and high levels of transaminases. Herbal and dietary supplement-induced liver injury is more severe than other types of DILI and re-exposure is more likely. Increasing awareness of the hepatoxic effects of herbal and dietary supplements could help physicians make earlier diagnoses and reduce the risk of serious liver damage.

DOI: 10.1016/j.cgh.2017.12.051
PMID: 29307848

2. Hepatic Damage by Natural Remedies. Andrade RJ, Medina-Caliz I, Gonzalez-Jimenez A, Garcia-Cortes M, Lucena MI.

Semin Liver Dis. 2018 Feb;38(1):21-40. doi: 10.1055/s-0038-1623518. Epub 2018 Feb 22.

The rising burden of herbal and dietary supplement hepatotoxicity (HILI) is a growing concern in Western countries. The estimated incidence of HILI in well-designed prospective studies ranges from less than 1 to 3 individuals per 100,000 inhabitants/year. Herbal hepatotoxicity has a particular signature encompassing female predominance, hepatocellular type of damage with markedly elevated transaminases on presentation, more common unintentional rechallenge, and a greater risk of death/liver transplantation. Herbal hepatotoxicity recognition is particularly challenging for hepatologists because of the often hidden herbal consumption, difficulties in identifying the causative herbal component, and the possibility of contamination, adulteration, and misidentification, which preclude a proper adjudication and lead to inaccurate reporting of cases in scientific journals. Collaborative efforts to retrieve detailed phenotypic data and biological samples of patients with HILI would facilitate genomic and other molecular approaches for a better understanding of host risk factors and, hopefully, for biomarker identification.

DOI: 10.1055/s-0038-1623518
PMID: 29471563

3. Unexplained chronic liver disease in Ethiopia: a cross-sectional study. Orlien SMS, Ismael NY, Ahmed TA, Berhe N, Lauritzen T, Roald B, Goldin RD, Stene-Johansen K, Dyrhol-Riise AM, Gundersen SG, Morgan MY, Johannessen A.

BMC Gastroenterol. 2018 Feb 13;18(1):27. doi: 10.1186/s12876-018-0755-5.

BACKGROUND: Hepatitis B virus (HBV) infection is assumed to be the major cause of chronic liver disease (CLD) in sub-Saharan Africa. The contribution of other aetiological causes of CLD is less well documented and hence opportunities to modulate other potential risk factors are being lost. The aims of this study were to explore the aetiological spectrum of CLD in eastern Ethiopia and to identify plausible underlying risk factors for its development. METHODS: A cross-sectional study was undertaken between April 2015 and April 2016 in two public hospitals in Harar, eastern Ethiopia. The study population comprised of consenting adults with clinical and radiological evidence of chronic liver disease. The baseline evaluation included: (i) a semi-structured interview designed to obtain information about the ingestion of alcohol, herbal medicines and local recreational drugs such as khat (Catha edulis); (ii) clinical examination; (iii) extensive laboratory testing; and, (iv) abdominal ultrasonography. RESULTS: One-hundred-and-fifty patients with CLD (men 72.0%; median age 30 [interquartile range 25-40] years) were included. CLD was attributed to chronic HBV infection in 55 (36.7%) individuals; other aetiological agents were identified in a further 12 (8.0%). No aetiological factors were identified in the remaining 83 (55.3%) patients. The overall prevalence of daily khat use was 78.0%, while alcohol abuse, defined as > 20 g/day in women and > 30 g/day in men, was rare (2.0%). Histological features of toxic liver injury were observed in a subset of patients with unexplained liver injury who underwent liver biopsy. CONCLUSION: The aetiology of CLD in eastern Ethiopia is largely unexplained. The widespread use of khat in the region, together with histopathological findings indicating toxic liver injury, suggests an association which warrants further investigation.

DOI: 10.1186/s12876-018-0755-5
PMCID: PMC5812015
PMID: 29439653

4. Panax ginseng and Panax quinquefolius: From pharmacology to toxicology. Mancuso C, Santangelo R.

Food Chem Toxicol. 2017 Sep;107(Pt A):362-372. doi: 10.1016/j.fct.2017.07.019. Epub 2017 Jul 8.

The use of Panax ginseng and Panax quinquefolius in traditional Chinese medicine dates back to about 5000 years ago thanks to its several beneficial and healing properties. Over the past few years, extensive preclinical and clinical evidence in the scientific literature worldwide has supported the beneficial effects of P. ginseng and P. quinquefolius in significant central nervous system, metabolic, infectious and neoplastic diseases. There has been growing research on ginseng because of its favorable pharmacokinetics, including the intestinal biotransformation which is responsible for the processing of ginsenosides -contained in the roots or extracts of ginseng - into metabolites with high pharmacological activity and how such principles act on numerous cell targets. The aim of this review is to provide a simple and extensive overview of the pharmacokinetics and pharmacodynamics of P. ginseng and P. quinquefolius, focusing on the clinical evidence which has shown particular effectiveness in specific diseases, such as dementia, diabetes mellitus, respiratory infections, and cancer. Furthermore, the review will also provide data on toxicological factors to support the favorable safety profile of these medicinal plants.

DOI: 10.1016/j.fct.2017.07.019
PMID: 28698154 [Indexed for MEDLINE]

5. Fat burner-induced acute liver injury: Case series of four patients. Gavrić A, Ribnikar M, Šmid L, Luzar B, Štabuc B.

Nutrition. 2018 Mar;47:110-114. doi: 10.1016/j.nut.2017.10.002. Epub 2017 Nov 6.

Dietary supplements known as "fat burners" are typically marketed with claims of increasing energy expenditure through alterations in fat metabolism. They are marketed as natural products and their use is thus perceived as a safe body weight reduction strategy. We report on five episodes of liver injury in four patients. Liver injury was associated with consumption of different commercially available fat burners: Green tea extract (Camellia sinensis), Garcinia gummi-gutta, green coffee beans, and spirulina (blue-green algae). The

patients were admitted to the Department of Gastroenterology and Hepatology at the University Medical Center Ljubljana, in Slovenia, from May 2010 to July 2015. The first patient developed acute liver failure and had to be treated by liver transplantation. Second patient developed acute hepatitis that resolved spontaneously. Another patient required multiple surgical procedures due to severe hemorrhage after liver biopsy. The last patient was treated for two separate episodes of fat burner-induced liver injury after ingesting two different products, in 2010 and 2015. Liver biopsy was performed in all patients and histopathologic examination revealed no other cause of liver injury. Viral, autoimmune, and metabolic liver diseases were excluded, making unsupervised consumption of fat burners the most likely causative agent.

DOI: 10.1016/j.nut.2017.10.002
PMID: 29310849

6. Garcinia Cambogia, Diabetic Ketoacidosis, and Pancreatitis. Bystrak T, Cervera-Hernandez ME, Reddy N, King Z, Bratberg J.

R I Med J. 2017 Oct 2;100(10):48-50.

Garcinia cambogia (GC) is a dietary supplement marketed primarily for weight loss, as well as for appetite suppression, cholesterol reduction, and blood sugar control. Hydroxycitric acid (HCA) is the active ingredient in GC products. The primary mechanism of action of HCA for weight loss is via inhibition of adenosine triphosphatase (ATP) citratelyase, preventing the conversion of citrate to oxaloacetate and acetyl coenzyme A (ACA). Inhibiting the formation of oxaloacetate and ACA reduces fatty acid synthesis in the cell cytosol. There have been several reports of adverse effects associated with consumption of GC including hepatotoxicity, rhabdomyolysis, nephropathy, serotonin toxicity and cardiovascular toxicity. We report the case of a 56-year-old woman who presented with diabetic ketoacidosis (DKA), pancreatitis, and stress cardiomyopathy after several weeks of GC consumption.

[Full article available at http://rimed.org/rimedicaljournal-2017-10.asp].

PMID: 28968624 [Indexed for MEDLINE]

7. Reversible granulocyte abnormalities after accidental ingestion of Colchicum autumnale. Kritikos A, Spertini O.

Blood. 2017 Jul 6;130(1):95. doi: 10.1182/blood-2017-02-766410.

DOI: 10.1182/blood-2017-02-766410
PMID: 28684450 [Indexed for MEDLINE]

8. Dietary Supplement-Drug Interaction-Induced Serotonin Syndrome Progressing to Acute Compartment Syndrome. Patel YA, Marzella N.

Am J Case Rep. 2017 Aug 25;18:926-930.

BACKGROUND Dietary supplements have been associated with an increase in emergency intervention as a result of unexpected adverse events. Limited resources and information on significant drug-drug interactions with dietary supplements and prescription medications have contributed to associated complications and unexpected events. We present the case of a patient who consumed multiple prescription medications and dietary supplements which resulted in significant complications. CASE REPORT A 28-year-old man presented to the Emergency Department complaining of severe calf pain after exercising. In addition to his prescription medications, which included sertraline, he also consumed dietary supplements prior to his workout. He developed serotonin syndrome with rhabdomyolysis, which rapidly progressed to acute compartment syndrome. An emergency bilateral four-compartment double-incision lower extremity and forearm fasciotomy was performed, with complete recovery. CONCLUSIONS Drug-drug interactions involving dietary supplements are frequently overlooked in most healthcare settings, especially in the Emergency Department. Health care providers should be cognizant of the potential drug- drug interactions resulting in serotonin syndrome to prevent the progression to acute compartment syndrome and associated complications. Pharmacists play a key role in recognizing drug-dietary supplement interactions and adverse effects.

PMCID: PMC5580516
PMID: 28839121 [Indexed for MEDLINE]

9. Agranulocytosis Induced by Sinomenine Hydrochloride. Chen J, Zhong B, Wang Y.

Am J Case Rep. 2017 Sep 6;18:959-962.

BACKGROUND Sinomenine hydrochloride is an alkaloid that is extracted from the Chinese herbal plant Sinomenium acutum, and is used as a herbal medicine in the treatment or rheumatic disease. This report is the first to describe a case of sinomenine hydrochloride-induced agranulocytosis. CASE REPORT A 44-year-old woman with systemic lupus erythematosus (SLE) and systemic sclerosis (SSc) was treated with sinomenine hydrochloride and developed agranulocytosis with a neutrophil count of 0.01×10^9/L. She subsequently developed an opportunistic bacterial infection. Bone marrow aspiration showed a severe reduction in the proportion of mature granulocytes. The patient discontinued sinomenine hydrochloride therapy and was treated with granulocyte colony-stimulating factor (G-CSF) and antibiotics. The patient showed a return to normal granulocyte levels within ten days of discontinuing treatment with sinomenine hydrochloride. CONCLUSIONS The findings of this case report show that monitoring of bone marrow function and granulocyte levels should be performed during treatment with sinomenine hydrochloride.

PMCID: PMC5597034
PMID: 28874654 [Indexed for MEDLINE]

10. An interesting case of opium tea toxicity. Seyani C, Green P, Daniel L, Pegden A.

BMJ Case Rep. 2017 Apr 28;2017. pii: bcr-2016-218971. doi: 10.1136/bcr-2016-218971.

We present an unusual cause of respiratory arrest resulting from sole ingestion of home-brewed opium tea. A 64-year-old woman was found unresponsive and in respiratory arrest by a first responder. There were no obvious signs of regular recreational drug use. On presentation to the local district general hospital, the patient was in extremis, with severe physiological and biochemical derangements. A naloxone infusion was commenced and she later made a good recovery. It was subsequently discovered that she had brewed opium tea from opium buds she had picked from a nearby commercial poppy farm, a practice she had learnt while in Afghanistan.

DOI: 10.1136/bcr-2016-218971
PMID: 28455458 [Indexed for MEDLINE]

11. Case of drug-induced acute pancreatitis produced by horsetail infusions. García Gavilán MD, Moreno García AM, Rosales Zabal JM, Navarro Jarabo JM, Sánchez Cantos A.

Rev Esp Enferm Dig. 2017 Apr;109(4):301-304. doi: 10.17235/reed.2017.4157/2015.

INTRODUCTION: The most frequent causes of acute pancreatitis are biliary stones, alcohol consumption, smoking and tumors. Some of them do not have any established cause, and they are catalogued as idiopathic pancreatitis. CASE REPORT: We report the case of a 56-year-old woman with a history of bilateral adrenalectomy on hormone replacement therapy with corticosteroids, who has recurrent episodes of mild acute pancreatitis with an etiologic study (laboratory and imaging tests) without significant findings. A drug-induced etiology was suspected, so corticosteroids were removed and antihypertensive treatment was modified, but the clinical manifestations persisted. Later regular consumption of horsetail infusions was detected, and after their suspension the patient became asymptomatic and has not presented new episodes. DISCUSSION: The drug-induced acute pancreatitis is a strange cause of pancreatitis that is frequently underdiagnosed because of the difficulty to establish a relationship between the drugs and the pancreatitis. Lots of drugs have been related with acute pancreatitis, while the information available for herbal products is limited. They usually present like mild and recurrent episodes, without significant findings in both laboratory and imaging tests (abdominal ultrasound, abdominal computed tomography [CT], cholangiography and endoscopic ultrasound). It is important to detect the origin of this type of pancreatitis to prevent recurrence.

DOI: 10.17235/reed.2017.4157/2015

PMID: 28112963 [Indexed for MEDLINE]

12. Ginkgo biloba induced mood dysregulation: a case report. Rho SS, Woo YS, Bahk WM.

BMC Complement Altern Med. 2018 Jan 15;18(1):14. doi: 10.1186/s12906-018-2081-4.

BACKGROUND: Impairment of cognitive function as well as negative symptom is the major factor causing the decline of a patient's functioning in chronic stages of schizophrenia. However, until now, there were no definite treatment options that could effectively reduce the impairment. CASE PRESENTATION: We report a case of mood dysregulation associated with use of Ginkgo biloba in a patient with schizophrenia. After Ginkgo biloba was given, the patient experienced cluster symptoms of mood dysregulation including irritability, difficulty in controlling anger, agitation and restlessness. We estimated the possibility as "probable" according to Naranjo scale considering circumstantial evidence. CONCLUSIONS: This case suggests that Ginkgo biloba may have caused mood dysregulation in this patient. Although it is generally accepted as safe, more attention should be given to the adverse effect when treating with Ginkgo biloba.

DOI: 10.1186/s12906-018-2081-4
PMCID: PMC5769324
PMID: 29334964 [Indexed for MEDLINE]

13. Resveratrol has anti-thyroid effects both in vitro and in vivo. Giuliani C, Iezzi M, Ciolli L, Hysi A, Bucci I, Di Santo S, Rossi C, Zucchelli M, Napolitano G.

Food Chem Toxicol. 2017 Sep;107(Pt A):237-247. doi: 10.1016/j.fct.2017.06.044. Epub 2017 Jun 28.

Resveratrol is a natural polyphenol with antioxidant, anti-inflammatory, and antiproliferative properties. We have shown previously that resveratrol decreases sodium/iodide symporter expression and iodide uptake in thyrocytes, both in vitro and in vivo. In the present study, we further investigated the effects of resveratrol, with evaluation of the expression of additional thyroid-specific genes in the FRTL-5 rat thyroid cell line: thyroglobulin, thyroid peroxidase, TSH receptor, Nkx2-1, Foxe1 and Pax8. We observed decreased expression of these genes in FRTL-5 cells treated with 10 μM resveratrol. The effects of resveratrol was further evaluated in vivo using Sprague-Dawley rats treated with resveratrol 25 mg/kg body weight intraperitoneally, for 60 days. No clinical signs of hypothyroidism were seen, although the treated rats showed significant increase in thyroid size. Serum TSH and thyroid hormone levels were in the normal range, with significantly higher TSH seen in resveratrol-treated rats, compared with control rats. Histological and immunohistochemical analyses confirmed increased proliferative activity in the thyroid from resveratrol-treated rats. These data suggest that resveratrol acts as a thyroid disruptor and a goitrogen, which indicates the need for caution as a supplement and for therapeutic uses.

DOI: 10.1016/j.fct.2017.06.044
PMID: 28668442 [Indexed for MEDLINE]

14.Pregnancy, prescription medicines and the potential risk of herb-drug interactions: a cross-sectional survey. McLay JS, Izzati N, Pallivalapila AR, Shetty A, Pande B, Rore C, Al Hail M, Stewart D.

BMC Complement Altern Med. 2017 Dec 19;17(1):543. doi: 10.1186/s12906-017-2052-1.

BACKGROUND: Pregnant women are routinely prescribed medicines while self-medicating with herbal natural products to treat predominantly pregnancy related conditions. The aim of this study was to assess the potential for herb-drug interactions (HDIs) in pregnant women and to explore possible herb-drug interactions and their potential clinical significance. METHODS: A cross-sectional survey of women during early pregnancy or immediately postpartum in North-East Scotland. Outcome measures included; Prescription medicines use excluding vitamins and potential HDIs assessed using Natural Medicines Comprehensive Database. RESULTS: The survey was completed by 889 respondents (73% response rate). 45.3% (403) reported the use of at least one prescription medicine, excluding vitamins. Of those taking prescription medicines, 44.9% (181) also reported concurrent use of at least one HNP (Range 1-12). A total of 91 different prescription medicines were reported by respondents using HNPs. Of those taking prescription medicines, 44.9% (181) also reported concurrent use of at least one HNP (Range 1-12). Thirty-four herb-drug interactions were identified in 23 (12.7%) women with the potential to increase the risk of postpartum haemorrhage, alter maternal haemodynamics, and enhance maternal/fetal CNS depression. Almost all were

rated as moderate (93.9%), one as a potentially major (ginger and nifedipine) and only one minor (ondansetron and chamomile). CONCLUSION: Almost half of pregnant women in this study were prescribed medicines excluding vitamins and minerals and almost half of these used HNPs. Potential moderate to severe HDIs were identified in an eighth of the study cohort. Healthcare professionals should be aware that the concurrent use of HNPs and prescription medicines during pregnancy is common and carries potential risks.

DOI: 10.1186/s12906-017-2052-1
PMCID: PMC5738179
PMID: 29258478 [Indexed for MEDLINE]

15. Pregnancy and herbal medicines: An unnecessary risk for women's health-A narrative review. Bruno LO, Simoes RS, de Jesus Simoes M, Girão MJBC, Grundmann O

Phytother Res. 2018 Feb 8. doi: 10.1002/ptr.6020. [Epub ahead of print]

The indiscriminate use of herbal medicines to prevent or to heal diseases or even the use for questionable purposes such as weight loss has received both interest and scrutiny from the scientific community and general public alike. An increasing number of women put their own and the unborn child's health at risk due to a lack of knowledge about the phytochemical properties and adequate use of herbal medicine (phytomedicines or herbal supplements) and lack of communication with their healthcare provider. The purpose of this narrative review was to summarize the use of herbal medicines during pregnancy and their potential toxic effects to highlight the importance of caution when prescribing herbal medicines or supplements for women, because, in addition to suffering interactions and a great amount of information obtained in preclinical predictive studies, assessment of nephrotoxicity, neurotoxicity, hepatotoxicity, genotoxicity, and teratogenicity of traditional medicinal herbs still remains scarce in the clinical setting.

DOI: 10.1002/ptr.6020
PMID: 29417644

16. Detecting Signals of Interactions Between Warfarin and Dietary Supplements in Electronic Health Records. Fan Y, Adam TJ, McEwan R, Pakhomov SV, Melton GB, Zhang R.

Stud Health Technol Inform. 2017;245:370-374.

Drug and supplement interactions (DSIs) have drawn widespread attention due to their potential to affect therapeutic response and adverse event risk. Electronic health records provide a valuable source where the signals of DSIs can be identified and characterized. We detected signals of interactions between warfarin and seven dietary supplements, viz., alfalfa, garlic, ginger, ginkgo, ginseng, St. John's Wort, and Vitamin E by analyzing structured clinical data and unstructured clinical notes from the University of Minnesota Clinical Data Repository. A machine learning-based natural language processing module was further developed to classify supplement use status and applied to filter out irrelevant clinical notes. Cox proportional hazards models were fitted, controlling for a set of confounding factors: age, gender, and Charlson Index of Comorbidity. There was a statistically significant association of warfarin concurrently used with supplements which can potentially increase the risk of adverse events, such as gastrointestinal bleeding.

PMCID: PMC5760175
PMID: 29295118

17. Critical evaluation of causality assessment of herb-drug interactions in patients. Awortwe C, Makiwane M, Reuter H, Muller C, Louw J, Rosenkranz B.

Br J Clin Pharmacol. 2018 Jan 24. doi: 10.1111/bcp.13490. [Epub ahead of print]

The aim of this review was to assess the severity of adverse drug reactions (ADRs) due to herb-drug interactions (HDI) in patients taking herbs and prescribed medications based on published evidence. Electronic databases of PubMed, the Cochrane Library, Medline and Scopus were searched for randomized or nonrandomized clinical studies, case-control and case reports of HDI. The data were extracted and the causal relationship of ADRs as consequences of HDI assessed using Horn's drug interaction probability scale or Roussel Uclaf Causality Assessment Method scoring systems. The mechanism of interaction was

ascertained using Stockley's herbal medicine interaction companion. Forty-nine case reports and two observational studies with 15 cases of ADRs were recorded. The majority of the patients were diagnosed with cardiovascular diseases (30.60%), cancer (22.45%) and renal transplants (16.32%) receiving mostly warfarin, alkylating agents and cyclosporine, respectively. HDI occurred in patients resulting in clinical ADRs with different severity. Patients may poorly respond to therapeutic agents or develop toxicity due to severe HDI, which in either scenario may increase the cost of treatment and/or lead to or prolong patient hospitalization. It is warranted to increase patient awareness of the potential interaction between herbs and prescribed medicines and their consequences to curb HDI as a potential health problem.

DOI: 10.1111/bcp.13490
PMID: 29363155

18. Abuse and Misuse of Selected Dietary Supplements Among Adolescents: a Look at Poison Center Data. Biggs JM, Morgan JA, Lardieri AB, Kishk OA, Klein-Schwartz W.

J Pediatr Pharmacol Ther. 2017 Nov-Dec;22(6):385-393. doi: 10.5863/1551-6776-22.6.385.

OBJECTIVE: The use of dietary supplements has increased and is associated with adverse effects. Indications for use include recreation, body image concerns, mood enhancement, or control of medical conditions. The risk of adverse effects may be enhanced if agents are used improperly. The objective of this study was to determine the frequency of abuse and misuse of 4 dietary substances among adolescents reported nationally to poison centers. Secondary outcomes included an assessment of medical outcomes, clinical effects, location of treatments provided, and treatments administered. METHODS: This descriptive retrospective review assessed data concerning the use of garcinia (Garcinia cambogia), guarana (Paullinia cupana), salvia (Salvia divinorum), and St John's wort (Hypericum perforatum) among adolescents reported nationally to poison centers from 2003 to 2014. Adolescents with a single substance exposure to one of the substances of interest coded as intentional abuse or misuse were included. Poison center calls for drug information or those with unrelated clinical effects were excluded. Data were collected from the National Poison Data System. RESULTS: There were 84 cases: 7 cases of Garcinia cambogia, 28 Paullinia cupana, 23 Salvia divinorum, and 26 Hypericum perforatum. Garcinia cambogia was used more frequently by females (100% versus 0%), and Paullinia cupana and Salvia divinorum were used more frequently by males (61% versus 36% and 91% versus 9%, respectively). Abuse, driven by Salvia divinorum, was more common overall than misuse. Abuse was also more common among males than females ($p < 0.001$). Use of these agents fluctuated over time. Overall, use trended down since 2010, except for Garcinia cambogia use. In 62 cases (73.8%), the medical outcome was minor or had no effect or was judged as nontoxic or minimally toxic. Clinical effects were most common with Paullinia cupana and Salvia divinorum. Treatment sites included emergency department (n = 33; 39.3%), non-healthcare facility (n = 24; 28.6%), admission to a health care facility (n = 8; 9.5%), and other/unknown (n = 19; 22.6%). CONCLUSIONS: Abuse and misuse of these dietary supplements was uncommon, and outcomes were mild. Further research should be performed to determine use and outcomes of abuse/misuse of other dietary supplements in this population.

DOI: 10.5863/1551-6776-22.6.385
PMCID: PMC5736249
PMID: 29290737

19. The Content of Mercury in Herbal Dietary Supplements. Brodziak-Dopierała B, Fischer A, Szczelina W, Stojko J.

Biol Trace Elem Res. 2018 Jan 17. doi: 10.1007/s12011-018-1240-2. [Epub ahead of print]

The dietary supplement market in Poland has been growing rapidly, and the number of registered products and their consumption increases steadily. Among the most popular and the easiest to get are herbal supplements, available in any supermarket. The aim of this paper was to investigate the mercury content in the herbal supplements. The dietary supplements that have been examined (24) are available on the Polish market and contain one or more herbal ingredients. Supplements were pulverized in porcelain mortar and identified by AMA 254 atomic absorption spectrometer. The range of variations for all tested supplements was within 0.02-4293.07 μg/kg. The arithmetic mean of the total result was 193.77 μg/kg. A higher mercury content then this mean was found in preparations-bamboo shoots and alga Chlorella pyrenoidosa. The studies have shown that mercury is present in every examined herbal supplement, and its content exceeds in two preparations (with bamboo and alga) the permissible limit of 0.10 mg/kg. There were statistically significant

differences in the occurrence of mercury depending on the herbal ingredient in the supplement. The lowest content was found in the preparation with Tanacetum parthenium and the highest with bamboo shoots. The mercury content in the tested herbal supplements was statistically significant in the form of a supplement-a tablet and a capsule. Daily, weekly, monthly, and yearly consumption of mercury with examined supplements was calculated-the results did not exceed the PTWI-provisional tolerable weekly intake of mercury. To increase consumer safety, it is imperative to conduct further research on dietary supplements and implement a stricter quality control of the dietary supplements.

DOI: 10.1007/s12011-018-1240-2
PMID: 29344817

20. Dietary supplement use among cancer survivors and the general population: a nation-wide cross-sectional study. Song S, Youn J, Lee YJ, Kang M, Hyun T, Song Y, Lee JE.

BMC Cancer. 2017 Dec 28;17(1):891. doi: 10.1186/s12885-017-3885-1.

BACKGROUND: Use of dietary supplements among cancer survivors is common and controversial, but information on the amount of nutrients from supplements among cancer survivors is limited. We examined the amount of nutrients and their contribution to total nutrient intake from supplements and compared these data between cancer survivors and cancer-free individuals. We also identified factors associated with supplement use among cancer survivors. METHODS: We identified 400 cancer survivors and 10,387 cancer-free individuals, aged ≥ 19 years, from the fifth Korea National Health and Nutrition Examination Survey (KNHANES) V-1, 2 (2010, 2011). We calculated the amount of nutrients consumed from foods and supplements, the percent contributions of supplement nutrients to total nutrient intakes and cancer survivors' nutrient intakes relative to the Estimated Average Requirements (EARs) and the Tolerable Upper Intake Levels (ULs). We examined factors associated with supplement use among cancer survivors. RESULTS: We found that 33.3% of cancer survivors and 22.1% of cancer-free individuals reported the use of dietary supplements. Compared to cancer-free individuals, cancer survivors had higher intakes of riboflavin, folate, and iron from foods ($p < 0.05$ for each), and higher intakes of calcium ($p = 0.05$) and vitamin C ($p = 0.01$) from foods and supplements. The similar pattern was observed for the percent contributions to total nutrient intake. Cancer survivors had higher proportion of participants below EARs than cancer-free individuals for thiamin and niacin ($p < 0.05$ for each). The proportions of cancer survivors below the EARs were 61.2% for calcium, 49.1% for riboflavin, and 43.5% for folate and the proportions of cancer survivors above the ULs were 3.3% for iron, and 2.3% for vitamin A. For female cancer survivors, education above an elementary school level, moderate physical activity, low vegetable intake, and high circulating vitamin D levels were associated with supplement use. For male cancer survivors, living in an urban area, no consumption of alcohol, and lower energy intake, were associated with supplement use. CONCLUSIONS: Korean cancer survivors have higher rate of dietary supplement use and higher contribution from supplements to total nutrient intake than cancer-free individuals. Demographic and lifestyle factors were associated with supplement use among cancer survivors.

DOI: 10.1186/s12885-017-3885-1
PMCID: PMC5745960
PMID: 29282002

21. A review of traditional and current methods used to potentially reduce toxicity of Aconitum roots in Traditional Chinese Medicine. Liu S, Li F, Li Y, Li W, Xu J, Du H.

J Ethnopharmacol. 2017 Jul 31;207:237-250. doi: 10.1016/j.jep.2017.06.038. Epub 2017 Jun 28.

CONTEXT: Aconitum species are well-known for their medicinal value and high lethal toxicity in many Asian countries, notably China, India and Japan. The tubers are only used after processing in Traditional Chinese Medicine (TCM). They can be used safely and effectively with the methods of decoction, rational compatibility, and correct processing based on traditional experiences and new technologies. However, high toxicological risks still remain due to improper preparation and usage in China and other countries. Therefore, there is a need to clarify the methods of processing and compatibility to ensure their effectiveness and minimize the potential risks. OBJECT: The aim of this paper is to provide a review of traditional and current methods used to potentially reduce toxicity of Aconitum roots in TCM. MATERIALS AND METHODS: The use of Aconitum has been investigated and the methods of processing and compatibility throughout history, including recent research, have been reviewed. RESULTS AND CONCLUSIONS: Using

of the methods of rational preparation, reasonable compatibility, and proper processing based on traditional experiences and new technologies, can enable Aconitum to be used safely and effectively.

DOI: 10.1016/j.jep.2017.06.038
PMID: 28666834 [Indexed for MEDLINE]