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NLM Citation: LiverTox: Clinical and Research Information on Drug-Induced Liver Injury [Internet]. Bethesda (MD): National Institute of Diabetes and Digestive and Kidney Diseases; 2012-. Slippery Elm. [Updated 2024 Jan 5].
Bookshelf URL: https://www.ncbi.nlm.nih.gov/books/

Slippery Elm

Updated: January 5, 2024.

OVERVIEW

Introduction

Slippery elm (Ulmus rubra) is a broad leafed deciduous tree native to Eastern and Central United States and Canada, the inner bark of which is used orally to treat sore throat and gastrointestinal upset and topically for skin rash and irritation. Slippery elm preparations are generally recognized as safe and there is no evidence that it can cause elevations in liver related enzymes or clinically apparent liver injury.

Background

Slippery elm (Ulmus rubra) is a broad leafed, medium sized, deciduous tree native to Eastern and Central United States and Canada. The inner bark of slippery elm, when stripped of the outer bark, can be used as a lozenge to treat sore throat, as a pill for gastrointestinal upset, and as a cream or ointment for skin rash and wound healing. Slippery elm resembles the American Elm (Ulmus Americana) but is less stately and less susceptible to Dutch Elm disease. Also known as red elm, it is called slippery because of the slippery texture of the inner bark when it is chewed or mixed with water. Its medicinal effects appear to be due to stimulation of mucous and saliva, which may alleviate sore or dry throat and coat irritated or ulcered esophageal or gastric mucosa. Slippery elm preparations were used in Native American traditional medicine for gastrointestinal and urinary tract disorders and topically for skin diseases. The active ingredients appear to be mucilages, but the inner bark is also rich in tannins and resins which are astringents and may account for some of its effects. While not approved as therapy for any disease or condition, over-the-counter preparations are sold as demulcents and for gastrointestinal upset. There is no reliable data on adverse events from slippery elm and it is designated as "generally recognized as safe" (GRAS). There have been no large scale clinical trials that have reported on adverse events associated with use of slippery elm preparations. Slippery elm has been linked to rare instances cutaneous allergic symptoms.

Hepatotoxicity

While slippery elm is generally recognized as safe, it has not been formally assessed for hepatic adverse effects or elevations of serum aminotransferases, alkaline phosphatase or bilirubin levels. In addition, despite common use, there have been no published case reports of liver injury attributed to slippery elm. Large case series of liver injury due to herbal and dietary supplements do not mention or list slippery elm as an implicated cause of liver injury.

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

Drug Class: Herbal and Dietary Supplements

Other names: Indian elm, Moose Elm, Orme, Sweet elm, Ulmus fulva.

PRODUCT INFORMATION

REPRESENTATIVE TRADE NAMES

Slippery Elm – Generic

DRUG CLASS

Herbal and Dietary Supplements

SUMMARY INFORMATION

Fact Sheet at MedlinePlus, NLM

CHEMICAL FORMULA AND STRUCTURE

DRUG	CAS REGISTRY NUMBER	MOLECULAR FORMULA	STRUCTURE
Slippery Elm	90028-27-6	Not applicable	SID: 135275635

ANNOTATED BIBLIOGRAPHY

References updated: 05 January 2024

Abbreviations: DILI, drug induced liver injury; HDS, herbal and dietary supplements; LDL-C, low density lipoprotein cholesterol.

Zimmerman HJ. Unconventional drugs. Miscellaneous drugs and diagnostic chemicals. In, Zimmerman, HJ. Hepatotoxicity: the adverse effects of drugs and other chemicals on the liver. 2nd ed. Philadelphia: Lippincott,1999: pp. 731-4.

(Expert review of hepatotoxicity published in 1999; several herbal medications are discussed, but not slippery elm).

Liu LU, Schiano TD. Hepatotoxicity of herbal medicines, vitamins and natural hepatotoxins. In, Kaplowitz N, DeLeve LD, eds. Drug-induced liver disease. 2nd ed. New York: Informa Healthcare USA, 2007, pp. 733-54.

(Review of hepatotoxicity of herbal and dietary supplements [HDS] published in 2007; no mention of slippery elm).

Slippery Elm. In, PDR for Herbal Medicines. 4th ed. Montvale, New Jersey: Thomson Healthcare Inc. 2007: pp. 755-756.

(Compilation of short monographs on herbal medications and dietary supplements, mentions that "no health hazards or side effects are known" to be associated with its use).

Jacobsson I, Jönsson AK, Gerdén B, Hägg S. Spontaneously reported adverse reactions in association with complementary and alternative medicine substances in Sweden. Pharmacoepidemiol Drug Saf 2009; 18: 1039-47. PubMed PMID: 19650152.

(Among 778 spontaneous reports of adverse reactions to herbal and alterative medicines to a national Swedish Registry, no cases were attributed to slippery elm).

Cho AR, Lee SY, Cho YH, Kim CM, Kim SG. Effects of 4-week intervention with Ulmus macrocarpa Hance Extract on immune function biomarkers in healthy adults: a randomized controlled trial. Evid Based Complement Alternat Med. 2018;2018:5690816. PubMed PMID: 29681977.

(Among 50 healthy controls treated with an Ulmus macrocarpa extract [500 mg] or placebo once daily for 4 weeks, minor changes occurred in serum cytokine levels but "No change in liver function, renal function or CK were observed in either group").

Lee YL, Lee SY. Potential lipid-lowering effects of Ulmus macrocarpa Hance extract in adults with untreated high low-density lipoprotein cholesterol concentrations: A randomized double-blind placebo-controlled trial. Front Med (Lausanne). 2022;9:1000428. PubMed PMID: 36388925.

(Among 80 patients with elevated low density lipoprotein cholesterol [LDL-C] levels were treated with an extract of Ulmus macrocarpa [500 mg daily] or placebo for 12 weeks, LDL-C levels deceased more with U. macrocarpa than placebo [-23 vs -9 mg/dL] and there were no side effects and no significant changes in liver enzyme concentrations).

Teschke R, Wolff A, Frenzel C, Schulze J, Eickhoff A. Herbal hepatotoxicity: a tabular compilation of reported cases. Liver Int 2012; 32: 1543-56. PubMed PMID: 22928722.

(A systematic compilation of all publications on the hepatotoxicity of specific herbal products identified 185 publications on 60 different herbs, herbal drugs and supplements but does not list or mention slippery elm).

Bunchorntavakul C, Reddy KR. Review article: herbal and dietary supplement hepatotoxicity. Aliment Pharmacol Ther 2013; 37: 3-17. PubMed PMID: 23121117.

(Systematic review of literature on HDS associated liver injury does not mention slippery elm).

Navarro VJ, Seeff LB. Liver injury induced by herbal complementary and alternative medicine. Clin Liver Dis 2013; 17: 715-35. PubMed PMID: 24099027.

(Review of the epidemiology, regulatory status, diagnosis, pathogenesis and causes of liver injury from herbal products with specific discussion of conjugated linoleic acid, ephedra, germander, green tea, usnic acid, flavocoxid, aloe vera, chaparral, greater celandine, black cohosh, comfrey, kava, skullcap, valerian, noni juice, pennyroyal and traditional herbal remedies; no mention of slippery elm).

Navarro VJ, Barnhart H, Bonkovsky HL, Davern T, Fontana RJ, Grant L, Rleddy KR, et al. Liver injury from herbals and dietary supplements in the U.S. Drug-Induced Liver Injury Network. Hepatology 2014; 60: 1399-408. PubMed PMID: 25043597.

(Among 839 cases of liver injury from drugs collected in the US between 2004 and 2013, 130 were due to HDS products, including 45 from body building agents [probably anabolic steroids] and 85 from diverse HDS products but no case was attributed specifically to slippery elm).

Brown AC. Liver toxicity related to herbs and dietary supplements: Online table of case reports. Part 2 of 5 series. Food Chem Toxicol 2017; 107: 472-501. PubMed PMID: 27402097.

(Description of an online compendium of cases of liver toxicity attributed to HDS products, does not list or discuss slippery elm).

Medina-Caliz I, Garcia-Cortes M, Gonzalez-Jimenez A, Cabello MR, Robles-Diaz M, Sanabria-Cabrera J, Sanjuan-Jimenez R, et al.; Spanish DILI Registry. Herbal and dietary supplement-induced liver injuries in the Spanish DILI Registry. Clin Gastroenterol Hepatol. 2018;16:1495-1502. PubMed PMID: 29307848.

(Among 856 cases of hepatotoxicity enrolled in the Spanish DILI Registry between 1994 and 2016, 32 were attributed to herbal products, the most frequent cause being green tea [n=8] and Herbalife products [n=6], no mention of slippery elm).

Ballotin VR, Bigarella LG, Brandão ABM, Balbinot RA, Balbinot SS, Soldera J. Herb-induced liver injury: systematic review and meta-analysis. World J Clin Cases. 2021;9:5490-5513. PubMed PMID: 34307603.

(Systematic review of the literature on HDS induced liver injury identified 446 references describing 936 cases due to 79 different herbal products, the most common being He Shou Wu [91], green tea [90] Herbalife products [64], kava kava [62] and greater celandine [48]; slippery elm is not listed or discussed).

Bessone F, García-Cortés M, Medina-Caliz I, Hernandez N, Parana R, Mendizabal M, Schinoni MI, et al. Herbal and dietary supplements-induced liver injury in Latin America: experience from the LATINDILI Network. Clin Gastroenterol Hepatol. 2022;20:e548-e563. PubMed PMID: 33434654.

(Among 367 cases of hepatotoxicity enrolled in the Latin American Drug-Induced Liver Injury Network between 2011 and 2019, 29 [8%] were attributed to herbal products, the most frequent being green tea [n=7], Herbalife products [n=5] and garcinia [n=3]; slippery elm is not mentioned).