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Licorice

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Drug Levels and Effects

Summary of Use during Lactation

Licorice (Glycyrrhiza glabra) root contains glycyrrhizin (also called glycyrrhizic acid or glycyrrhizinic acid) and a mixture of the potassium and calcium salts of glycyrrhizic acid. Glycyrrhizin is metabolized to the active glycyrrhetinic acid in the intestine. Deglycyrrhizinated licorice (DGL) has had glycyrrhizin removed. Licorice is a purported galactogogue, and is included in some Asian proprietary mixtures to increase milk supply; however, no scientifically valid clinical trials support this use. In fact, licorice usually reduces serum prolactin,[1] which might decrease milk production in the early stages of lactation. Women taking licorice have experienced elevated blood presure.[2] Galactogogues should never replace evaluation and counseling on modifiable factors that affect milk production.[3]

Glycyrrhizin is detectable in the breastmilk of some women taking licorice, but studies measuring glycyrrhetinic acid have not been performed. Licorice has been used safely and effectively in combination with other herbs given to infants as a tea for the short-term treatment of colic.[4] However, two infants whose mothers had an excessive intake of an herbal tea that contained licorice had signs of anethole toxicity.[5] Because both of these papers reported on herbal mixtures, the effect(s) of licorice alone cannot be determined. Licorice and licorice extract are "generally recognized as safe" (GRAS) as foods by the U.S. Food and Drug Administration. Long-term, excessive use of licorice can cause hypertension, hypokalemia, and disturbances of adrenal hormones, and therefore should probably be avoided during nursing.

Dietary supplements do not require extensive pre-marketing approval from the U.S. Food and Drug Administration. Manufacturers are responsible to ensure the safety, but do not need to *prove* the safety and effectiveness of dietary supplements before they are marketed. Dietary supplements may contain multiple ingredients, and differences are often found between labeled and actual ingredients or their amounts. A manufacturer may contract with an independent organization to verify the quality of a product or its ingredients, but that does *not* certify the safety or effectiveness of a product. Because of the above issues, clinical testing results on one product may not be applicable to other products. More detailed information about dietary supplements is available elsewhere on the LactMed Web site.

Drug Levels

Maternal Levels. Ten lactating women with breast engorgement were treated with the Kakkonto extract granules (Tsumura, [Juntendo, Japan]), which contains a mixture of various herb extracts, including licorice. The dose was 2.5 grams 3 times daily (about 400 mg daily of licorice extract). Glycyrrhizin was measured in the breastmilk at unspecified times. Glycyrrhizin was detected in 2 women at 1.14 mg/L and 0.15 mg/L, and in 3 women at <0.1 mg/L. It was undetectable in the remaining 5 women.[6]

Infant Levels. Relevant published information was not found as of the revision date.

Effects in Breastfed Infants

Two breastfed infants, aged 15 and 20 days, were admitted to the hospital for a reported lack of weight gain in the previous 7 to 10 days, caused by "difficult feeding". The parents reported restlessness and vomiting during the past day. One of the mothers also reported feeling drowsy and weak. On examination, the infants were afebrile but had hypotonia, lethargy, emesis, weak cry, poor sucking and weak responses to painful stimuli. Infant laboratory values, electrocardiograms and blood pressures were normal, and septic work-ups were negative. Both mothers had both been drinking more than 2 liters daily of an herbal tea mixture reportedly containing licorice, fennel, anise, and goat's rue to stimulate lactation. After the mothers discontinued breastfeeding and the herbal tea, the infants improved within 24 to 36 hours. Symptoms of the affected mother also resolved rapidly after discontinuing the herbal tea. After 2 days, breastfeeding was reinstituted with no further symptoms in the infants. Both infants were doing well at 6 months of age. The authors attributed the maternal and infant symptoms to anethole, which is found in both anise and fennel; however, the anethole levels were not measured in breastmilk, nor were the teas tested for their content.[5]

Effects on Lactation and Breastmilk

A woman with a history of excessive licorice intake had amenorrhea, severe headaches, hypertension, hypokalemia. She had elevated serum prolactin levels that remained abnormal for one month after licorice discontinuation and normalized by 6 months after discontinuation.[7]

In a study of 25 men and 25 women, the baseline and thyrotropin-stimulated serum prolactin levels were measured to determine normal serum prolactin values. Subjects who regularly ingested licorice had lower basal and lower stimulated serum prolactin concentrations.[1]

A traditional, nonstandardized decoction of peony and licorice roots called Shaoyao-Gancao-Tang in Chinese and Shakuyaku-Kanzo-To in Japanese was studied in women with elevated serum prolactin caused by long-term (>6 months) ingestion of risperidone. Patients received either bromocriptine 5 mg daily for 4 weeks followed by 4 weeks of 22.5 grams daily of the peony-licorice decoction (equivalent to 25 mg of glycyrrhetinic acid), or the same drugs in the reverse order. Evaluation of serum prolactin found that both treatments reduced serum prolactin by 21 to 28% from baseline at 4 and 8 weeks.[8]

Forty women who complained of an insufficient milk supply at 5 days postpartum were given a combination herbal supplement as 2 capsules of Lactare (Pharma Private Ltd., Madras, India; currently available from TTK Pharma, Chennai, India) 3 times daily. Each capsule contained wild asparagus 200 mg, ashwagandha (Withania somnifera) 100 mg, fenugreek 50 mg, licorice 50 mg, and garlic 20 mg. By day 4 of therapy, no infants required supplementary feeding. Infants were weighed before and after each feeding on the fifth day of maternal therapy to determine the amount of milk ingested. On the day of the test weighing, infants' milk intake averaged 388 mL, and the fluid and caloric intake was considered adequate.[9] This study cannot be considered as valid evidence of a galactogogue effect of these herbs because it lacks randomization, blinding, a placebo control, and maternal instruction in breastfeeding technique. Additionally, infants were breastfed only 6 to 8 times daily, which is insufficient to maximize milk supply at this stage of lactation.

Women who were between 14 and 90 days postpartum and reported lactation failure were given instructions on breastfeeding technique and encouraged to exclusively breastfeed. If their infant had gained less than 15 grams in 1 week, they were randomized to receive either two tablespoonfuls of a mixture containing wild asparagus or an identical placebo for 4 weeks. In each 100 grams, the mixture contained Asparagus racemosus 15 grams, Anethum soiva 1 gram, Ipomea digitata 1 gram, Glycyrrhiza glabra 1 gram, Spinacia oleracea 2.5 grams, Cuminum cyminum 0.5 gram, and Panchatrinamol 1 gram. Of the 64 women randomized, 11 did not complete the trial. Serum prolactin measurements were made before a morning nursing before treatment and after 4 weeks of treatment. Infant weight gains and the number of supplemental feedings were recorded initially and after 4 weeks of therapy. No differences were found in the changes in serum prolactin, infant weight gain or amount of supplementation between the treatment and placebo groups after 4 weeks of therapy. No side effects or changes in liver function tests occurred during the study.[10]

A study in Japan compared the use of a mixture of 13 herbs, including licorice, to ergonovine for their effects on lactation and serum prolactin in postpartum women. The herbal mixture, called Xiong-gui-tiao-xue-yin, was given in a randomized fashion to 41 women in a dose of 2 grams of a dried aqueous extract 3 times daily. A comparable group of 41 women were randomized to receive methylergonovine 0.375 mg daily. Therapy was started on the day of delivery, but the duration of therapy was not specified. Plasma oxytocin and prolactin were measured on days 1 and 6; milk volumes were measured daily, although the method of measuring milk volume was not specified. Serum prolactin was higher on days 1 and 6 in the women who received the herbals; plasma oxytocin was lower on day 1 in the women who received the herbal, but not different on day 6. Milk volumes were greater on days 4, 5, and 6 in women who received the herbal mixture.[11] This study has serious flaws that make its interpretation impossible. First, milk volume measurement is subject to considerable variability depending on the measurement method used, but the method was not specified. Second, methylergonovine has caused decreases in serum prolactin and milk production in some studies.[12][13] Because of the lack of a placebo group, the differences found could be a negative effect of methylergonovine rather than a positive effect of the herbal preparation. Because this study used a multi-ingredient combination products in which licorice was only one component, the results might be different from studies in which licorice was used alone.

In an uncontrolled, non-blinded multicenter study in India, 1132 patients who reported inadequate milk supply were give a mixture (Lactancia, Corona Remedies Pvt. Ltd.) To take in a dose of 30 grams twice daily. The product contains Asparagus racemosus (wild asparagus, shatavari), Cuminum cyminum (cumin) , Glycyrrhiza glabra (licorice), Spinacia oleracea (spinach) as well as amino acids, vitamins, minerals and DHA. Most of the mothers (1049) had improved lactation and increased infant weight.[14] However, with no placebo control group, results cannot be attributed to the product.

References

1. Le Moli R, Endert E, Fliers E, Mulder T, Prummel MF, Romijn JA et al. Establishment of reference values for endocrine tests. II: Hyperprolactinemia. Neth J Med. 1999;55:71-5. PubMed PMID: 10474275.
2. Cuzzolin L, Zaffani S, Benoni G. Safety implications regarding use of phytomedicines. Eur J Clin Pharmacol. 2006;62:37-42. PubMed PMID: 16328317.
3. Brodribb W. ABM Clinical Protocol #9: Use of galactogogues in initiating or augmenting maternal milk production, second revision 2018. Breastfeed Med. 2018;13:307-14. PubMed PMID: 29902083.
4. Weizman Z, Alkrinawi S, Goldfarb D, Bitran C. Efficacy of herbal tea preparation in infantile colic. J Pediatr. 1993;122:650-2. PubMed PMID: 8463920.
5. Rosti L, Nardini A, Bettinelli ME, Rosti D. Toxic effects of a herbal tea mixture in two newborns. Acta Paediatr. 1994;83:683. Letter. PubMed PMID: 7919774.
6. Shimada K, Sakaguchi T, Sato Y et al. [Simultaneous determination of ephedrine and glycyrrhizin in human breast milk by high performance liquid chromatography]. Yakugaku Zasshi. 1984;104:347-50. PubMed PMID: 6491873.

7. Werner S, Brismar K, Olsson S. Hyperprolactinaemia and liquorice. Lancet. 1979;1:319. PubMed PMID: 84965.
8. Yuan HN, Wang CY, Sze CW et al. A randomized, crossover comparison of herbal medicine and bromocriptine against risperidone-induced hyperprolactinemia in patients with schizophrenia. J Clin Psychopharmacol. 2008;28:264-370. PubMed PMID: 18480682.
9. Sholapurkar ML. 'Lactare' for improving lactation. Indian Pract. 1986;39:1023-6.
10. Sharma S, Ramji S, Kumari S, Bapna JS. Randomized controlled trial of Asparagus racemosus (Shatavari) as a lactogogue in lactational inadequacy. Indian Pediatr. 1996;33:675-7. PubMed PMID: 8979551.
11. Ushiroyama T, Sakuma K, Souen H et al. Xiong-gui-tiao-xue-yin (Kyuki-chouketsu-in), a traditional herbal medicine, stimulates lactation with increase in secretion of prolactin but not oxytocin in the postpartum period. Am J Chin Med. 2007;35:195-202. PubMed PMID: 17436360.
12. Peters F, Lummerich M, Breckwoldt M. Inhibition of prolactin and lactation by methylergometrine hydrogenmaleate. Acta Endocrinol (Copenh). 1979;91:213-6. PubMed PMID: 463447.
13. Arabin B, Ruttgers H, Kubli F. [Effects of routine administration of methylergometrine during puerperium on involution, maternal morbidity and lactation]. Geburtshilfe Frauenheilkd. 1986;46:215-20. PubMed PMID: 3519353.
14. Mehta A. Efficacy of amino acids, vitamins, minerals, docosahexaenoic acid, galactagogue combination on lactation: A postmarketing surveillance study. J S Afr Fed Obstet Gynecol. 2014;6:118-22.

Substance Identification

Substance Name

Licorice

Scientific Name

Glycyrrhiza glabra

CAS Registry Number

84775-66-6

Drug Class

Breast Feeding

Lactation

Complementary Therapies

Food

Phytotherapy

Plants, Medicinal