The Academy Of Breastfeeding Medicine

ABM Protocols

A central goal of **The Academy of Breastfeeding Medicine** is the development of clinical protocols for managing common medical problems that may impact breastfeeding success. These protocols serve only as guidelines for the care of breastfeeding mothers and infants and do not delineate an exclusive course of treatment or serve as standards of medical care. Variations in treatment may be appropriate according to the needs of an individual patient.

Protocol #9: Use of galactogogues in initiating or augmenting maternal milk supply

BACKGROUND

Galactogogues (or lactogogues) are medications or other substances believed to assist initiation, maintenance, or augmentation of maternal milk production. Because low milk supply is one of the most common reasons given for discontinuing breastfeeding,[1] both mothers and physicians have sought medicine to address this concern. Breast milk production is a complex physiologic process involving physical and emotional factors and the interaction of multiple hormones, the most important of which is believed to be prolactin. With parturition and expulsion of the placenta, progesterone falls and a full milk supply is initiated (Lactogenesis II).[2] Through interaction with the hypothalamus and anterior pituitary, dopamine agonists inhibit, and dopamine antagonists increase, prolactin secretion and thereby milk production (endocrine control). Thereafter, prolactin levels gradually decrease but milk supply is maintained or increased by local feedback mechanisms (autocrine control).[3] Therefore, an increase in prolactin levels is needed to increase, but not maintain, milk supply. If the breasts are not emptied regularly and thoroughly, milk production declines. Likewise, more frequent and thorough emptying of the breasts typically results in increased milk production. Use of galactogogues for faltering milk supply should generally be reserved for situations after both a thorough evaluation for treatable causes (e.g., maternal hypothyroidism or medication) and increased frequency of breastfeeding or pumping or expression has not been successful.

INDICATIONS FOR GALACTOGOGUES

Common indications for galactogogues are adoptive nursing (induction of lactation in a woman who was not pregnant with the current child), relactation (reestablishing milk supply after weaning), and increasing a faltering milk supply because of maternal or infant illness or separation. Mothers who are not directly breastfeeding but are expressing milk by hand or with a pump often experience a decline in milk production after several weeks. One of the most common indications for galactogogues is to augment a declining milk supply in mothers of preterm or ill infants in the neonatal intensive care unit.

PROCEDURE

1. **Before using any substance to try to increase milk supply, a full evaluation of current maternal milk supply and effectiveness of milk transfer is imperative.** Attention must be directed to the evaluation and augmentation of frequency and thoroughness of milk removal. This can be accomplished through increased frequency and duration of breastfeeding (if the infant has been shown to be effective at emptying the breasts) or pumping. A full-size, automatic cycling breast pump, capable of draining both breasts ("hospital grade") at the same time is recommended, if available. Problems such as inappropriate

timing and duration of feedings, inappropriate supplementation, mother-infant separation, ineffective latch, and inadequate milk transfer should be corrected.

2. **Women should be informed of any data (or lack thereof) regarding the efficacy, safety, and timing of use of galactogogues.** With the exception of adoptive nursing, where galactogogues are started *before* the birth of the baby, there is no research to suggest that starting galactogogues within the first week postpartum is efficacious.

3. **Mothers should be screened for contraindications to the chosen medication or substance and informed as to possible side effects.** Although a lactation consultant may recommend the medication or herb, it is the physician's responsibility to prescribe medications and follow the mother and infant.

4. **The physician who prescribes the medication is obligated to follow, or to ensure appropriate follow-up, of both mother and infant regarding milk supply and any side effects.** In practice, many times it is the nurse practitioner, pediatrician, or neonatologist who is asked to prescribe a galactogogue and not the obstetrician-gynecologist. As is commonly found when dealing with lactation, family physicians are ideally situated to manage this issue.

5. **Although short-term use (1–3 weeks) has been evaluated for some of these substances, long-term use has not been studied.** Anecdotal reports suggest no increase in side effects with the most commonly used medications (metoclopramide, domperidone, fenugreek), but long term effects on both mother and infant are unknown.

SPECIFIC GALACTOGOGUES

Many medications, foods, and herbal therapies have been recommended as galactogogues. The medications used often exert their effects through antagonism of dopamine receptors, resulting in increased prolactin. In many cases, the mechanism(s) of action are unknown.

Metoclopramide

Metoclopramide (Reglan) is the most well studied and most commonly used medication for inducing or augmenting lactation in the United States. It promotes lactation by antagonizing the release of dopamine in the central nervous system, thereby increasing prolactin levels.[4] It is an antiemetic and also commonly used for gastroesophageal reflux in infants. Although levels found in breast milk have been measured higher than maternal serum levels, levels in infants have been undetectable or well below infant therapeutic levels with no reported side effects.[5] Metoclopramide does not appear to alter milk composition significantly.[6,7] Many studies have shown its efficacy in the induction and augmentation of milk production.[8–19] However, there is one controlled trial that failed to show efficacy.[20]

Maternal restlessness, drowsiness, fatigue, and diarrhea may occur but usually do not require stopping the medication.[4,15] The drug should be discontinued if any of the rare extrapyramidal side effects of sleeplessness, headache, confusion, dizziness, mental depression, or feelings of anxiety or agitation occur. Acute dystonic reactions are very rare (<.05%) and may require diphenhydramine (Benadryl) treatment. Metoclopramide should not be used if patients have epilepsy or are on antiseizure medications, have a history of significant depression or are on antidepressant drugs, have a pheochromocytoma or uncontrolled hypertension, have intestinal bleeding or obstruction, or have a known allergy or prior reaction to metoclopramide.[4] Metoclopramide does transfer into the milk, but research has demonstrated no side effects in the infants of mothers taking metoclopramide.[8–19,21]

The usual dose is 30 to 45mg/day in three or four divided doses, with a dose-response effect up to 45 mg daily.[13] It is usually given for 7 to 14 days at full dose with a taper off over 5 to 7 days. Longer periods of use may be associated with an increased incidence of depression. Occasionally a mother's milk supply will falter as the dose is reduced, and the lowest effective dose has been continued for longer periods successfully. Some experts also advise a gradual increase when beginning the dosage.

Domperidone (Motilium)

Domperidone is also a dopamine antagonist that is available outside the United States for the treatment of gastroesophageal reflux and emesis.[22] Because of its drug characteristics it is less likely to cross the maternal blood-brain barrier, resulting in less extrapyramidal side effects than metoclopramide. Domperidone is also less likely than metoclopramide to cross into the breast milk.[11] Administration of domperidone results in significant increases in mean serum prolactin levels in normal women.[24,25] Domperidone is the only galactogogue evaluated in a randomized controlled trial and shown to be safe and effective in increasing breast milk production.[24]

Side effects are very uncommon and include dry mouth, headache (resolved with decreased dosage), and abdominal cramps.[22] Chronic high-dose treatment with domperidone in rodents has been associated

with increased numbers of breast tumors. This has not been reported in humans. Domperidone is contraindicated in patients with known sensitivity to the drug and in situations in which gastrointestinal stimulation might be dangerous (e.g., gastrointestinal hemorrhage, mechanical obstruction, or perforation). Despite the fact that domperidone is approved for use in most of the developed world and has been used for many years with an excellent safety record, the U.S. Food and Drug Administration (FDA) issued a warning against its use in the United States based on safety concerns with IV use and risks associated with drug importation.[40] There is no evidence that oral administration is associated with toxicity in either mother or infant. [40]

The usual dosage is 10 to 20 mg three to four times per day taken for 3 to 8 weeks. Most women respond within 3 to 4 days, but some women respond in 24 hours, and some require 2 to 3 weeks to get maximum effect.[25]

Sulpiride (Egonyl) and chlorpromazine (Thorazine)

Sulpiride is an antipsychotic (neuroleptic) medication not available in the United States that acts as a galactogogue by increasing prolactin-releasing hormone from the hypothalamus. Two studies have shown an increase in milk supply over placebo. Maternal side effects may include the extrapyramidal effects listed above for metoclopramide and possibly weight gain. The suggested dosage is 50 mg two or three times daily.[26–28]

Psychiatric practitioners have long noted galactorrhea in both males and females taking chlorpromazine (also a neuroleptic). A dose of 25 mg orally three times daily for 1 week has been shown in case reports to increase milk supply.

As both sulpiride and chlorpromazine increases prolactin levels by blocking dopamine receptors (and therefore the prolactin-inhibiting action of dopamine), extrapyramidal side effects are again possible.[29]

Human growth hormone

One randomized, double-blind, placebo-controlled trial of human growth hormone in a dose of 0.1 IU/kg/day subcutaneously noted a significant increase in milk volume by day 7 in 16 healthy lactating women. There were no documented changes in milk composition or side effects reported in the mothers. The usefulness of this expensive, injectable galactogogue appears limited.[21,30]

Thyrotrophin-releasing hormone

Thyrotrophin-releasing hormone (TRH) is used in the United States to assess thyroid function. It causes the release of both thyroid-stimulating hormone (TSH) and prolactin from the pituitary. The most recent study suggests short-term use is both safe and effective, but long-term use has not been evaluated. Dosage was one spray (1 mg TRH) 4 times daily.[31] Other studies used IV (200 μg) or oral (5 mg) forms.[32] TRH is not commonly used.

Herbal/natural galactogogues

Throughout world history women have used certain herbs or foods to enhance their milk supply. Most of these substances have not been scientifically evaluated but traditional use suggests safety and some efficacy. The mechanisms of action for all are unknown. Herbs commonly mentioned as galactogogues include fenugreek, goat's rue, milk thistle, anise, basil, blessed thistle, fennel seeds, marshmallow, and others. Beer is commonly used in some cultures, but alcohol may actually reduce milk production and there is no evidence to support that the yeasts in beer are effective galactogogues.

It is of note that herbs and dietary supplements were removed by the Federal 1994 Dietary Supplement Act from undergoing the rigorous evaluation by the U.S. Food and Drug Administration that is required for drugs. The composition of herbal and dietary supplements are unknown and have been known to contain toxic substances. This is especially true for herbs from mainland China. There is no standard dosing, preparation, or composition, and fraudulent preparations may be a risk.

Fenugreek *(Trigonella foenum-graecum)* is the most commonly recommended herbal galactogogue, treasured as a spice and medicine throughout India and the Middle East for thousands of years. It is a member of the pea family listed as GRAS (generally regarded as safe) by the U.S. Food and Drug Administration. Usual dose is one to four capsules (580–610 mg) three to four times per day, although as with most herbal remedies there is no standard dosing. The higher of these doses may be required in relactating or adoptive mothers. Alternatively, it can be taken as one cup of strained tea three times per day (¼ tsp seeds steeped in 8 oz water for 10 minutes).[33] Huggins[34] reported the anecdotal use of fenugreek in at least 1200 women with increased milk supply within 24 to 72 hours. Reported side effects are rare: maple like odor to sweat, milk, and urine; diarrhea; and increased asthmatic symptoms. Use during pregnancy is

not recommended because of its uterine stimulant effects. Fenugreek is known to lower blood glucose, so caution is advised. Two recent preliminary reports suggest effectiveness.[35,36]

Goat's Rue *(Galega officinalis)* is a traditional galactogogue, widely recommended in Europe, based on observations of increased milk supply when fed to cows in the 1900s. No controlled human trials have been done, and no adverse effects have been reported with the following possible exception: Maternal ingestion of a lactation tea containing extracts of licorice (*Glycyrrhiza glabra*), fennel, anise, and goat's rue was linked to drowsiness, hypotonia, lethargy, emesis, and poor suckling in two breastfed neonates. An infection work-up was negative, and symptoms and signs resolved on discontinuation of the tea and a 2-day break from breastfeeding.[37] The tea was not tested for contaminants or adulterants, and there have been no other adverse events reported in Europe or South America, where the herb is also used as a hypoglycemic agent. It is usually used as a tea (1 tsp dried leaves steeped in 8 oz water for 10 minutes) with 1 cup taken three times a day.[33]

Milk thistle *(Silybum marianum)* has been used historically throughout Europe, but there are no randomized controlled trials to validate its use. The plant is still commonly known as St. Mary's thistle in honor of the Virgin Mary. Early Christians believed that the white colored veins in the leaves were symbolic of her breast milk. The American Herbal Products Association gives it a rating of 1, meaning that the herb may be safely consumed when used appropriately and does not contraindicate its use during lactation.[38] It is used as a strained tea (simmer 1 tsp crushed seeds in 8 oz water for 10 minutes) taking two to three cups per day.[33]

CONCLUSIONS

Of the substances used to induce, maintain, or augment milk production, domperidone and metoclopramide appear to be the most clinically useful. Prior to the use of any galactogogue, evaluation and correction of any modifiable factors such as frequency and thoroughness of breast emptying should be addressed. Medication should never replace evaluation and counseling on modifiable factors or reassurance when appropriate. As with any medication given to lactating women, close follow-up of both mother and baby is essential.

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