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## INTEGRATIVE REVIEW OF THE LITERATURE

Uso de galactogogos no manejo da amamentação: revisão integrativa da literatura

Use of galactogogues in breastfeeding management: integrative literature review

Uso de galactogogos en el manejo de la lactancia materna: revisión integradora de la literatura

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### ABSTRACT

**Objective:** Identifying the available evidence in the literature about galactogogues substances (liquids, herbs or foods with properties to increase milk production). **Method:** an integrative literature review that surveyed the bases BDNF, LILACS and MEDLINE with the descriptors "lactation disorders", "breastfeeding", "galactogogues," in portuguese, english and spanish, until the year 2011. The final sample was formed of 27 articles. **Results:** the most prevalent galactogogues were: black beer, hydration, hominy, chicken soup, metoclopramide, chlorpromazine, domperidone, fenugreek and fennel. **Conclusion:** the culture permeates practice of breastfeeding and therefore must be considered by health professionals in guidance and encouragement to breastfeeding. **Descriptors:** Galactogogues, Lactation disorders, Breastfeeding.

### RESUMO

**Objetivo:** Identificar as evidências disponíveis na literatura sobre substâncias galactogogas (líquidos, ervas ou alimentos com propriedades de aumentar a produção láctea). **Método:** revisão integrativa da literatura que pesquisou as bases BDNF, LILACS e MEDLINE com os descritores: "transtornos da lactação", "aleitamento materno", "galactogogos", em português, inglês e espanhol, até o ano 2011. A amostra final foi de 27 artigos. **Resultados:** os galactogogos de maior prevalência foram: a cerveja preta, a hidratação, a canjica, a canja de galinha, a metoclopramida, a clorpromazina, a domperidona, o feno-grego e o funcho. **Conclusão:** o universo cultural permeia a prática do aleitamento materno e, portanto, deve ser contemplado pelos profissionais de saúde na orientação e no incentivo à amamentação. **Descritores:** Galactogogos, Transtornos da lactação, Aleitamento materno.

### RESUMEN

**Objetivo:** Identificar las evidencias disponibles en la literatura sobre las sustancias galactogogas (líquidos, hierbas o alimentos con propiedades para aumentar la producción de leche). **Método:** es una revisión integradora de la literatura que examino las bases BDNF, LILACS y MEDLINE utilizando los descriptores: "trastornos de la lactancia", "lactancia materna", "galactogogos" en portugués, inglés y español, hasta el año 2011. La muestra final fue de 27 artículos. **Resultados:** los galactogogos más prevalentes fueron: la cerveza negra, la hidratación, sémola de maíz, sopa de pollo, metoclopramida, clorpromazina, domperidona, fenogreco y el hinojo. **Conclusión:** el universo cultural impregna la práctica de la lactancia materna y por lo tanto deben ser considerados por los profesionales de la salud en la orientación y estímulo a la lactancia materna. **Descriptor:** Galactogogos, Trastornos de la lactancia, Lactancia materna.

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## INTRODUCTION

**T**he act of breastfeeding involves not only the biological urge, but also socio-psycho-cultural aspects, being surrounded by various myths and beliefs. Belief concerns the act of believing, or taking some concept as well, and myth in this context is understood as symbolic meaning, passed for generations by a certain group, being considered true by the same.<sup>1-2</sup>

The proper production of milk requires the growth of the secretory alveoli in glandular breast tissue, milk secretion by the secretory cells of the alveoli and emptying of the breast by suction or by expression as well as the integrity of the hypothalamic-pituitary axis. In addition, any mother and/or child factor that interferes with the effective transfer of breast milk to the infant can cause poor milk production by mechanical and chemical inhibition.<sup>1,3</sup>

Myths and beliefs permeate the discourse of nursing mothers in breastfeeding labor, especially in relation to their food and in low production of milk and real or perceived, in this way, to use substances with galactogogue properties. Galactogogues are drugs, liquids, herbs or foods that, according to local beliefs, contribute to the increase in milk production of puerperal.<sup>4-6</sup>

For an effective intervention in the labor of breastfeeding, it is essential that health professionals understand the influence of culture in this universe, respecting and sharing knowledge and customs in the practice of breastfeeding, since disregard the built or acquired by mothers beliefs can create barriers impairing those receiving prescribed care.<sup>6</sup> Given the above, this scientific study aims to describing the galactogogue used and reported in the literature.

## METHOD

It is an integrative review, research model that enables the synthesis of relevant published studies on the subject studied, and promote the improvement of clinical practice and decision making. For its realization, the following steps were followed: identification of the subject and formulation of the research question; establishment of the objective of the review; establishment of criteria for inclusion and exclusion of articles for sample selection; defining the information to be extracted from selected articles; assessment of studies included in the integrative review; interpretation and presentation of search results.<sup>7</sup>

To direct the revision it was used as guiding question: what the evidence available in the literature on the use of galactogogue as support breastfeeding?

There were used the following inclusion criteria: published articles by the year 2011 and available in electronic databases: Literature Latin American and Caribbean Health Sciences (LILACS), International Literature on Health Sciences (PubMed/MEDLINE), and Database of Nursing (BDENF). The descriptors were "disorders of lactation", "breastfeeding" and "galactogogues" in Portuguese, English and Spanish. As exclusion criteria: Articles for reflection, case studies and articles on international herbal medicine, when the medicinal plant was considered unknown/not used as galactogogue in Brazil were excluded.

Data collection was conducted in September 2012. The sample consisted of 27 articles that met the inclusion criteria.

## RESULTS E DISCUSSION

Publications on the subject dated from 1971 to 2011, with the largest number of publications occurring between the years 2004-2008, with prevalence in 2008.

The studies found were categorized into non-pharmacological, pharmacological and herbal methods.

Table 1 shows the non-pharmacological methods found as galactogogues are presented: stout, liquids, hominy, cow's milk, chicken soup, healthy food, guava with milk, corn with milk, alcohol, beer, eggnog, drink based on hot cereal, coconut milk and rice pudding.

The belief that alcohol is galactogenic persists in many cultures, being transmitted in some cases even by health professionals, who claim that ingestion of small amounts of alcohol increases the production of milk in the mammary glands,<sup>30</sup> facilitates milk ejection, relaxes both mother and child, as well as providing calories and fluids.<sup>17</sup>

The dark beer, widespread ingestion, not be filtered in the process of production, has a higher content of yeast and proteins that may be associated with increased milk production.<sup>3</sup>

The beer of the component responsible for the effect on the secretion of prolactin is not the alcohol content, but apparently a polysaccharide from barley, which explains that the effect of prolactin can also be induced in non-alcoholic beer. It is conceivable that the relaxing effects of alcohol and the components of hops may also have beneficial effects on lactogenesis in some women, but there is no concrete evidence of causal effects.<sup>18,31</sup>

The intake of ethanol in the amount from 1.5 to 1.9g/kg body weight may reduce significantly the milk ejection reflex by lowering by 20% the intake of milk by the infant. One should also consider that even small amounts of alcohol pass into breast milk is enough to undermine the sleep pattern of the baby, change the organoleptic properties of milk and

reduce the consumption of milk by the baby despite strong initial suction related to the difficulty in obtaining the child breast milk for the lower rate of milk flow after moderate consumption of alcohol.<sup>32-33</sup>

Evidence refutes the myth that alcohol increases the lactation performance by pointing out that moderate alcohol consumption deregulates the release of the two main hormones of lactation - prolactin and oxytocin, respectively responsible for the induction of the secretion and milk ejection. Immediately after exposure to alcohol, the level of prolactin decreases increases as oxytocin, both during and after stimulation of maternal breast. Although alcohol consumption increase prolactin levels, decreased milk production and results in a longer latency period for milk ejection.<sup>34-35</sup> Thus, because of the adverse effects of alcohol on the mother-son, it is prudent not to advocate the regular use of alcohol during lactation.

Increased fluid intake is also very encouraged to boost milk production. It is believed that the water intake is directly proportional to milk yield, or increased the more the consumption of water greater will be the volume of milk produced. However, fluid intake in excess, does not cause increased production of milk, even a decrease, occurring since,<sup>36</sup> the body's reaction to excessive water intake (beyond the seat) is to eliminate excess fluid by diuresis in order to maintain proper fluid balance.<sup>37</sup>

The daily water recommendation for breastfeeding is 3,8L, among drinks, food and water. However, what was observed in a study conducted in the municipality of Teixeira-MG, highlighted the inadequacy of water consumption at 100% of the infants, showing a 0.5L to 3.5L intake. Considering this aspect, should encourage breastfeeding infant to maintain adequate hydration, that meets your daily fluid needs, but without exaggeration.<sup>38</sup>

Regarding the introduction of cow's milk in the diet of the nursing mother it should take into account that bovine milk whey there is a known protein as beta-lactoglobulin, which is present in almost all infant formulas. This protein is able to contaminate the breast milk of women who consume cow's milk and its derivatives, which leads to a chance of triggering an antigenic response in atopic infants. This fact therefore must be treated with caution, since the stimulus to consumption of this substance is considered unnecessary and can endanger the health of the suckling.<sup>1</sup>

Considering the other non-pharmacological methods cited as: chicken soup, eat healthier foods - fruits, vegetables - hominy, cane juice, molasses of water, eggnog, guava paste with milk, corn with milk, sweet rice, milk coconut-based drinks hot cereal, we note that such foods have in their composition proteins, carbohydrates, lipids, vitamins and minerals, essential for milk production in quality and quantity, still pondering the purpose other than would be to not reduce biological reserves of the mother.<sup>6,14</sup> As an example, grits, cornmeal and corn which are starchy and undergo the process of hydrolysis produces glucose, essential for the synthesis of milk.<sup>9</sup> Recalling that the energy cost of lactation is accomplished mainly through food intake.<sup>1-2</sup>

Table 1-Distribution of studies pertaining to non-pharmacological methods of galactogogue substances.

Non-Pharmacological Methods	Quotes
Root beer	7 (4,6,8-11)
Liquids	6 (1,4-6,13-14)
Hominy	6 (6,8,10-11,14-15)
Cow's milk	6 (3-4,6,8,11,15)
Chicken soup	5 (10-12,14,16)
Healthy food	3 (6,15,16)
Guava with milk	2 (6,12)
Corn with milk	2 (6,12)
Alcohol	2 (1,17)
Beer	2 (1,18)
Eggnog	1 (5)
Hot cereals-based drinks	1 (1)
Coconut milk	1 (19)
Rice pudding	1 (11)

The data presented in Table 2 comprise information regarding pharmacological methods, the literature suggests the following galactogogue substances: metoclopramide, chlorpromazine, domperidone, sulpiride, growth hormone, thyrotropin-secreting hormone, oxytocin, theophylline, phenothiazines, droperidol, butyrophenones, opioid peptides, Prostaglandins, cimetidine, methyldopa, haloperidol, amphetamine and vitamin therapy.

Table 2-distribution of studies regarding pharmacological methods of galactogogue substances

Pharmacological Methods	Quotes
Metoclopramide	15 (2,6,14,18-19,20-26)
Domperidone	9 (2,18-19,20-24,26)
Chlorpromazine	8 (1,13-14,19-20,22-23,26)
Sulpiride	7 (1,14,19-20,22-23,26)
Growth hormone	6 (19-20,22-24,26)
Secretory hormone thyrotropin (TRH)	6 (1-2,20,22-23,26)
Oxytocin	4 (1,20,24,26)
Theophylline	1 (14)
Phenothiazines	1 (14)
Droperidol	1 (14)
Butyrophenones	1 (14)
Opioid peptides	1 (14)
Prostaglandins	1 (14)
Cimetidine	1 (14)

Methyldopa	1 <sup>(14)</sup>
Haloperidol	1 <sup>(14)</sup>
Amphetamines	1 <sup>(14)</sup>
Vitamin therapy	1 <sup>(10)</sup>

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Pharmacological methods as galactogogues act as dopamine antagonists. Thus, the neutralizing effect of the inhibitory action of dopamine on prolactin secretion causes increased serum levels of the latter substance, and consequent increase in milk production.<sup>22-23</sup>

It should also be noted adverse events of drugs on nursing mothers, since even safe for the baby drugs, can the mother, cause undesirable reactions and thus affect the quality of life of nursing or even the mother-child relationship during breastfeeding. Metoclopramide, more substance cited in the records, can cause extrapyramidal effects such as tremor, bradykinesia and dystonic reactions. Already chlorpromazine, an antipsychotic is requiring caution in the use for the occurrence of adverse reactions in the binomial as extrapyramidal symptoms, while domperidone,<sup>22</sup> it has lower lipid solubility and molecular weight greater than metoclopramide, becomes less permeable to the blood-brain barrier, offering low risk of extrapyramidal reactions.<sup>18,22,26</sup>

Regarding other drugs presented in the study, it is noteworthy mentioning that sulpiride is excreted in milk in significant amounts with possible adverse symptoms on the child as well as extrapyramidal effects on the mother.<sup>1,26,28</sup>

The effect of oxytocin is expected to facilitate the emptying of the breasts, rather than milk secretion. It is possible that the most effective emptying of milk contributes indirectly to increased production, but little is plausible that help start or reestablish milk production.<sup>3</sup> Moreover, the recombinant human growth hormone becomes important in optimizing induction of lactogenesis by having some similarity to prolactin, high concentrations of this substance soon trigger increased production of milk.<sup>39</sup>

Regarding the other pharmacological methods cited in the study, there was no consideration beyond what has already been mentioned about the drugs. We must also consider that there is no evidence that pharmacological galactogogue stimulate milk production in women with elevated prolactin levels or with inadequate breast tissue to lactation.<sup>29</sup>

Table 3 presents the galactogogues relating to herbal methods: Fenugreek (*Trigonella foenicum-graecum*), fennel (*Foeniculum vulgare*), English water, nettle (*Urtica dioica*), goat's rue (*Galega officinalis*), raspberry (*Rubus idaeus*), holy thistle (*Cnicus benedictus*), yerba mate (*Ilex paraguariensis*) in cotton (*Gossypum herbaceum*) and garlic (*Allium sativum*).

Table 3 - Distribution of studies relating to herbal methods of galactogogue substances

Herbal Methods	Quotes
Fenugreek ( <i>Trigonella foenicum-graecum</i> )	8 <sup>(2,18,20,22-23,26-28)</sup>
Fennel ( <i>Foeniculum vulgare</i> )	4 <sup>(4-5,23,29)</sup>
Goat's rue ( <i>Galega officinalis</i> )	3 <sup>(10,20,26)</sup>
English water	3 <sup>(9,14,19)</sup>
Nettle ( <i>Urtica dioica</i> )	2 <sup>(3,23)</sup>
Cotton ( <i>Gossypum herbaceum</i> )	2 <sup>(10,20)</sup>
Holy thistle ( <i>Cnicus benedictus</i> )	1 <sup>(23)</sup>
Haspberry ( <i>Rubus idaeus</i> )	1 <sup>(23)</sup>
Yerba mate ( <i>Ilex paraguariensis</i> )	1 <sup>(10)</sup>
Garlic ( <i>Allium sativum</i> )	1 <sup>(1)</sup>

The herbal methods, galactogenic mechanism of herb Fenugreek (*Trigonella foenicum-graecum*) has not been elucidated, however it has been theorized that can affect breast milk production by stimulating the production of sweat, since the breast is a gland modified sweat,<sup>20</sup> or increase levels of growth hormone representing a possible endocrinous mechanism<sup>28</sup> or to contain diosgenin in its seeds,<sup>40</sup> one Phytostrogenic compound<sup>40</sup> which induces the growth of breast tissue in ovariectomized mice.<sup>27</sup>

After initiation of therapy with Fenugreek, there is the increase in milk production within 24 to 72 hours, however, suggest the discontinuation of the herb after a milk production at an appropriate level that will be maintained, while any breast stimulation and emptying full.<sup>18,26</sup> confirming this increase in milk production, clinical trial conducted in Turkey with 66 postpartum women noted a significant increase in the volume of breast milk on the third day postpartum after ingestion of approximately 200 ml of tea fenugreek per day.<sup>41</sup>

This plant is recognized as safe by the Food and Drug Administration (FDA)<sup>20</sup> in the United States. However it is applied to a precaution diabetic mothers, since this substance is hypoglycemic (insulin-like property)<sup>18</sup>, moreover, also have been reported, some adverse effects of the plant such as diarrhea, allergic reactions and exacerbation of asthma symptoms. During pregnancy, the use of fenugreek is contraindicated for stimulating uterotonic activity.<sup>27,40</sup>

The Fennel (*Foeniculum vulgare*) or commonly called False Anis, Finóquio, Fennel, Fennel-Brazilian, Fake-sweet herb, sweet anise, have aromatic, culinary and medicinal properties. For medicinal purposes, are mainly used as fruit, root and sometimes fresh leaves.<sup>42</sup>

Fennel increases the secretion of milk to contain anethole and its polymers conferring the characteristic flavor and odor. Active agents are considered to possess estrogenic activity, whereas estrogens stimulate the release of prolactin.<sup>40</sup> Still, the mechanism galactopietic fennel can be explained by the structural similarity of anethole with dopamine, which inhibits prolactin secretion, but this effect can be suppressed by successful competition of anethole to dopamine receptors.<sup>43</sup>

Because doctors of the health network of Maringa properties and traditionalism Fennel indicate as galactogogue substitute safer to metoclopramide to increase lactation.<sup>42</sup>

The diuretic properties of fresh sap of the Nettle (*Urtica dioica*) are referred to as a lactogogue factor. However, due to the possibility of accumulation of heavy metals, using this is warned.<sup>40,43</sup>

Herbs and seeds of Goat's rue (*Galega officinalis*) have been used in folk medicine since the Middle Age, to stimulating the flow of milk in lactating.<sup>43</sup> Its lactogenic action is strongly correlated with the guanidine alkaloids that build tissue breast as well as increase the supply of milk, besides promising hypoglycemic activity. It is then necessary to monitor blood glucose levels of diabetic lactating. In the USA, is classified by the FDA as "indeterminate plant safety"<sup>40</sup> and the recommendation to use it in salad leaves fresh or dried herb infusion.<sup>43</sup>

The efficacy of raspberry leaf (*Rubus idaeus*) as a galactogogue is under debate, since it has astringent properties have the potential to reduce the mammary glands and thus reduce milk flow. However, provides vitamins and minerals that stimulate lactation and enrich breast milk, such as vitamins A, B, C and E complex, as well as calcium, iron, phosphorus and potassium, and there is no clinical evidence that it increases the production of breastmilk.<sup>44</sup>

Garlic (*Allium sativum*) is also recommended as a natural galactogogue.<sup>3</sup> A study found eating a garlic capsule by the mother who increased the residence time of the child to the breast during breastfeeding, compared with the ingestion of a placebo. However, if the mother repeatedly consumes garlic, no differences in the capsule ingestion test. However, garlic is contraindicated during lactation to cause colic in infants.<sup>45</sup>

Although cited as galactogogue, no items were found for scientific background in databases by associating scientific names of each herb with "galactogogue" or "galactogogue" for Blessed Thistle (*Cnicus benedictus*), Yerba mate (*Ilex paraguariensis*), the Cotton (*Gossypium herbaceum*) and the English Water.

The cultural value of teas and their association with motherhood has perhaps perpetuated its use during lactation. Herbs can have their "effectiveness" for nutrients and water provided, as well as promoting a sense of relaxation and self-efficacy.

Resolution No. 89 of March 16<sup>th</sup>, 2004 determines the "List of simplified registration of herbal medicines" and by means of this publication, inferred that herbal quoted in national, mainly international and articles are not approved by the National Sanitary Surveillance Agency as galactogogue.<sup>46</sup>



## CONCLUSION

It is essential that health professionals adds the cultural legacy of postpartum care, so that we find a balance between scientific and common sense, discouraging harmful practices described as the binomial and pondering the innocuous, since many of them, besides, be part of the cultural, family and community heritage, have a scientific basis that support their use.

It is important to encouraging studies on safety, efficacy and concentrations of galactogogue, especially medicinal plants, considering that Brazil is provided with a diverse flora, whose access is facilitated to the population. Validate the use of methods galactogogue is interesting to strengthen the institutional interest, especially in relation to the management of breastfeeding.

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