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Herbal Treatment of Infantile Bloating: A Review of the Most Effective Medicinal Plants for Infantile Gas Relief

Sajad Nourolahi [1]✉, **Nasrin Ghiasi**[2]

[1]Department of Pediatrics Division of Neonatalog, Ayatollah Taleghani Hospital, Ilam University of Medical Sciences, Ilam, Iran
[2]Department of Midwifery, Faculty of Medicine, Ilam University of Medical Sciences, Ilam, Iran

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✉ ***Correspondence to:***
Sajad Nourolahi

Email:
nourollahi1970@gmail.com

A B S T R A C T

Objective: Abdominal distension is among the most prevalent gastrointestinal disturbances in early infancy, characterized by persistent crying, restlessness, and abdominal discomfort. This condition often arises due to immature gastrointestinal function. In search of safe and natural remedies to alleviate these symptoms, traditional Iranian medicine alongside other complementary medical systems advocates the use of medicinal plants. The present study aims to review and introduce the key herbal remedies commonly employed in traditional medicine for reducing infantile colic.

Methods: This review is based on a comprehensive survey and critical analysis of reputable printed and digital sources on Iranian traditional medicine, herbal pharmacopoeias, scientific articles, and electronic databases. The most significant medicinal plants demonstrated to ease abdominal distension were identified, examined, and systematically categorized.

Results: According to classical texts and pharmacological references, herbal distillates derived from plants such as *Foeniculum vulgare* Mill., *Thymus vulgaris* L., *Cuminum cyminum* L., *Trachyspermum ammi* (L.) Sprague, *Matricaria chamomilla* L., *Glycyrrhiza glabra* L., *Coriandrum sativum* L., *Melissa officinalis* L., *Pimpinella anisum* L., *Apium graveolens* L., *Rumex acetosa* L., *Anethum graveolens* L., *Zingiber officinale* Roscoe, *Mentha piperita* L., *Lavandula angustifolia* Mill., *Olea europaea* L., *Prunus amygdalus* Batsch, *Cocos nucifera* L., *Peganum harmala* L. are commonly utilized in gentle stimulation of intestinal peristalsiss to soothe Bloating-related discomfort.

Conclusion: The findings underscore the substantial potential of Iranian traditional medicine in managing infantile colic through the use of herbal preparations. When applied thoughtfully and scientifically, these botanicals offer a complementary, safe, cost-effective, and efficacious approach to symptom relief. Nonetheless, it is strongly advised that any oral or topical use of herbal products in infants be supervised by qualified healthcare professionals or traditional medicine practitioners to prevent possible adverse effects.

Keywords: Abdominal distension, Medicinal plants, Traditional medicine, Complementary therapy, Infantile abdominal pain

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Introduction

Neonatal diseases, largely stemming from immature immune systems and underdeveloped organs, remain a major cause of infant mortality and require prompt diagnosis and care to prevent long-term physical and psychological complications [1]. Among these, gastrointestinal disorders are especially common and often distressing for both infants and their families [2]. One of the most frequently reported issues is abdominal distension, which presents with abdominal swelling, frequent crying, irritability, and sleep disturbances [1]. Although typically benign and self-limiting, this condition can significantly affect an infant's quality of life and disrupt family well-being. A clearer understanding of its causes, the role of nutrition, and effective preventive or therapeutic approaches is essential for promoting digestive health and easing parental concern [1]. Among these, gastrointestinal disorders such as bloating, reflux, colic, lactose intolerance, and intestinal infections are recognized as the most common complications during this critical developmental stage. These issues primarily stem from immature digestive function, improper feeding, or microbial factors [2]. If left unrecognized or untreated, such disorders can significantly impair the infant's growth and development [2].

Abdominal distension, one of the most frequent gastrointestinal complaints during the first months of life, typically arises from digestive enzyme insufficiency, air swallowing during feeding, and sensitivity to certain dietary components [3]. This condition is characterized by the accumulation of gas within the stomach and intestines, leading to abdominal distension and painful spasms. It manifests as restlessness, prolonged crying episodes, and sleep disturbances in infants [4]. Although abdominal distension is generally a benign and transient condition, it may occasionally signal underlying diseases such as lactose intolerance or food allergies, warranting careful medical evaluation [4].

From a pathophysiological standpoint, gas accumulation in the infant gastrointestinal tract results from enzyme deficiencies, inadequate intestinal motility, and air swallowing [5]. Excessive growth of gas-producing bacteria and abnormal fermentation of carbohydrates generate additional gases that increase intestinal wall pressure, causing abdominal distension and pain [5]. Infants experiencing bloating often exhibit behaviors such as irritability, drawing their legs towards the abdomen, kicking, and attempts to relieve gas pressure, sometimes accompanied by sleep disruption [5].

Preventive measures include ensuring a proper seal of the infant's lips during feeding, appropriate bottle positioning, slow feeding, timely burping, and maternal avoidance of gas-inducing foods to prevent transmission of bloating agents through breast milk [6].

Treatment primarily focuses on feeding adjustments, regular burping, stimulation of intestinal peristalsis, and stimulating bowel movements [7]. Breastfeeding is preferred due to easier digestion and reduced incidence of bloating [7]. When necessary, medications such as simethicone syrups, probiotics, and digestive enzymes may be prescribed under medical supervision [7]. In addition, traditional medicine recommends gentle herbal infusions like cumin, fennel, and chamomile, warm herbal oil massages, abdominal warming, and dietary modifications in the mother as safe and low-risk complementary approaches [8].

Herbal therapy, as a natural and low-risk method, plays a crucial role in managing abdominal distension, especially since many chemical drugs have restricted use or potential side effects in this vulnerable age group [9]. Mild herbal extracts and decoctions can improve digestion, reduce intestinal gas production, and maintain overall infant health [10].

Beyond causing irritability and frequent crying, abdominal distension disrupts the infant's sleep quality and family tranquility, increasing healthcare visits, medical costs, and psychological burden on families [11]. Conventional pharmacological treatments have limitations,

including uncertain efficacy and parental concerns about side effects, prompting families to increasingly turn to natural and traditional remedies [11].

Despite growing acceptance of herbal treatments, a lack of robust scientific data on their efficacy and safety remains a significant challenge [12]. The absence of extensive clinical trials and standardized herbal formulations limits the provision of strong evidence to broadly recommend these therapies [12]. Therefore, comprehensive and rigorous research is essential to evaluate the benefits and risks of herbal treatments for abdominal distension [12]. Furthermore, accurate differentiation between simple bloating and more serious gastrointestinal disorders with similar symptoms is critical. Timely and correct diagnosis can prevent dangerous complications and guide appropriate treatment [13]. Awareness among parents and healthcare providers of warning signs and the implementation of thorough diagnostic procedures are key to successful disease management [13].

Ultimately, effective management of abdominal distension requires a multifaceted approach encompassing nutritional adjustments, appropriate pharmacotherapy, targeted use of traditional medicine, and psychological support for families. This holistic strategy can reduce symptoms, improve the quality of life for infants and their caregivers, and provide a sustainable and effective treatment framework. Although medicinal plants are widely used for abdominal distension, their safety and efficacy necessitate scientific validation. Proper and supervised usage is vital to ensure infant health and prevent adverse effects. This study aims to explore traditional evidence related to the treatment of infantile bloating, with the goal of laying the groundwork for the development of natural and low-risk therapeutic approaches.

Methodology

This study was conducted as a review, encompassing a comprehensive search of both printed and digital sources such as PubMed, Scopus, SID, Magiran, or Google Scholar related to Iranian traditional medicine, herbal pharmacopoeias, scientific articles, and reputable databases. Inclusion criteria encompassed resources focusing on medicinal plants effective in reducing abdominal distension, articles published in Persian and English with full-text accessibility. Sources irrelevant to the subject, of poor quality, or lacking reliable data were excluded. Following initial screening, the most prominent medicinal plants were identified, analyzed, and categorized according to their pharmacological properties and clinical applications.

Results

Traditional medicine sources and pharmacological references indicate that herbal distillates extracted from species such as fennel, thyme, green cumin, ajwain, chamomile, licorice, coriander, lemon balm, anise, celery, savory, dill, ginger, and peppermint are extensively employed to alleviate abdominal distension. Additionally, topical application of plant oils and essential oils—including lavender, olive oil, sweet almond oil, coconut oil, and harmal—via stimulation of intestinal peristalsis has been reported as an effective method to relieve infant bloating. These compounds play a significant role in symptom improvement due to their antispasmodic and anti-inflammatory properties. Table 1 presents the botanical and pharmacological information of medicinal plants used to reduce abdominal distension in infants [14–34].

Table 1: Medicinal Plants Traditionally Employed in the Treatment of Abdominal distension in Iranian Traditional Medicine

No.	Persian Name	Common English Name	Scientific name	Herbal family	Traditional Usage	Plant Part Used	Mechanism of Action	Main Active Compound(s)/Chemical formula
1	Raziyaneh	Fennel	*Foeniculum vulgare* Mill.	Apiaceae	Herbal distillates	Seed	Antispasmodic, carminative, digestion stimulant	Anethole $C_{10}H_{12}O$
2	Avishan	Thyme	*Thymus vulgaris* L.	Lamiaceae	Herbal tea, inhalation	Leaf	Antimicrobial, antispasmodic, sedative	Thymol $C_{10}H_{14}O$
3	Zireh Sabz	Green Cumin	*Cuminum cyminum* L.	Apiaceae	Herbal distillates	Seed	Carminative, antispasmodic	Cumin aldehyde $C_{10}H_{12}O$
4	Zanyan	Ajwain	*Trachyspermum ammi* (L.) Sprague	Apiaceae	Herbal distillates	Seed	Carminative, antimicrobial	Thymol $C_{10}H_{14}O$
5	Babuneh	Chamomile	*Matricaria chamomilla* L.	Asteraceae	Herbal distillates, topical oil	Flower petals	Anti-inflammatory, antispasmodic, sedative	α-Bisabolol $C_{15}H_{26}O$
6	Shirin Biyan	Licorice	*Glycyrrhiza glabra* L.	Fabaceae	Herbal distillates	Root	Anti-inflammatory, antispasmodic	Glycyrrhizin $C_{42}H_{62}O_{16}$
7	Geshniz	Coriander	*Coriandrum sativum* L.	Apiaceae	Herbal distillates	Seed, leaf	Carminative, antispasmodic	Linalool $C_{10}H_{18}O$
8	Badranjebiyeh	Lemon balm	*Melissa officinalis* L.	Lamiaceae	Herbal	Leaf	Sedative, antispasmodic	Rosmarinic acid

					distillates			$C_{18}H_{16}O_8$
9	Anison	Anise	*Pimpinella anisum* L.	Apiaceae	Herbal distillates	Seed	Carminative, antispasmodic	Anethole $C_{10}H_{12}O$
10	Karafs	Celery	*Apium graveolens* L.	Apiaceae	Herbal distillates	Leaf, seed	Carminative, sedative	Lignans $C_{22}H_{22}O_8$
11	Shahtareh	Sorrel	*Rumex acetosa* L.	Polygonaceae	Herbal distillates	Leaf	Anti-inflammatory, antispasmodic	Tannins $C_{76}H_{52}O_{46}$
12	Shovid	Dill	*Anethum graveolens* L.	Apiaceae	Herbal distillates	Seed	Carminative, antispasmodic	Carvone $C_{10}H_{14}O$
13	Zanjebil	Ginger	*Zingiber officinale* Roscoe	Zingiberaceae	Herbal distillates	Rhizome	Anti-inflammatory, antispasmodic, antiemetic	Gingerol $C_{17}H_{26}O_4$
14	Na'na	Mint	*Mentha piperita* L.	Lamiaceae	Herbal distillates	Leaf	Antispasmodic, sedative, carminative	Menthol $C_{10}H_{20}O$
15	Ostokhodos	Lavender	*Lavandula angustifolia* Mill.	Lamiaceae	Herbal distillates, topical oil	Flower petals, leaf	Sedative, anti-inflammatory	Linalool $C_{10}H_{18}O$
16	Roghan Zeytoon	Olive oil	*Olea europaea* L.	Oleaceae	Herbal distillates, topical oil	Fruit	Anti-inflammatory, moisturizing	Oleic acid $C_{18}H_{34}O_2$

17	Roghan Badam Shirin	Sweet almond oil	*Prunus amygdalus* Batsch	Rosaceae	Herbal distillates, topical oil	Seed	Emollient, anti-inflammatory	Oleic acid $C_{18}H_{34}O_2$
18	Roghan Nargil	Coconut oil	*Cocos nucifera* L.	Arecaceae	Herbal distillates, topical oil	Fruit	Antimicrobial, moisturizing	Lauric acid $C_{12}H_{24}O_2$
19	Roghan Kharashtar	Peganum oil	*Peganum harmala* L.	Nitrariaceae	Herbal distillates, topical oil	Seed	Anti-inflammatory, antimicrobial	Flavonoids $C_{15}H_{10}O_2$

The majority of the plants mentioned belong primarily to two families: Apiaceae (the carrot family) and Lamiaceae (the mint family). A few species also come from other families such as Asteraceae (the daisy family), Fabaceae (legumes), Zingiberaceae (the ginger family), Oleaceae (the olive family), among others.

Most of these plants are used in the form of herbal distillates—commonly known as "aragh" in traditional Iranian medicine—a widely accepted and favored preparation method.

Regarding oils, such as olive, sweet almond, coconut, and kharashter oils, the application is specified as topical stimulation of intestinal peristalsis, indicating a local use aimed at alleviating bloating.

The specific plant organ utilized is of considerable importance, as each part contains distinct active compounds. As shown in the table, seeds (e.g., fennel, cumin), leaves (thyme, mint), flowers (chamomile), roots (licorice), rhizomes (ginger), and fruits (olive oil) have all been employed. Some plants, like coriander and celery, utilize multiple parts—both leaves and seeds—a scientifically recognized and common practice.

The mechanisms of action attributed to these plants include antispasmodic, carminative, sedative, anti-inflammatory, antimicrobial, moisturizing, emollient, digestive stimulant, and antiemetic effects.

Discussion

Abdominal distension is a common issue during the neonatal period, typically accompanied by symptoms such as intense crying, restlessness, and sleep disturbances, often causing considerable concern for parents. Given the sensitivity of this developmental stage and the limitations on using conventional pharmaceuticals in infants, natural and low-risk interventions hold particular significance. Traditional Iranian medicine (TIM) and other complementary medical systems have long advocated the use of medicinal plants as effective and safer approaches.

In TIM, colic is commonly addressed with fennel (Foeniculum vulgare) and ajwain (Trachyspermum ammi), which are traditionally administered alongside milk to the infant [35].

A recent study has demonstrated that medicinal plants such as peppermint, fennel, licorice, Iberogast, ginger, and compounds like cannabidiol serve as effective anti-bloating agents in infants. These substances alleviate bloating primarily through antispasmodic effects and enhancement of digestion, and they are widely utilized both in traditional and modern medicine to mitigate gastrointestinal discomfort [36].

Review of classical sources and contemporary research indicates that numerous medicinal plants possessing antispasmodic, carminative, and sedative properties play a significant role in alleviating digestive symptoms in infants [37]. Fennel [38] and green cumin [39], due to active constituents such as anethole and cumin aldehyde, exhibit positive effects on digestion and the reduction of intestinal gas accumulation [38, 39]. Plants like ajwain and chamomile have been recognized historically and continue to be valued for their efficacy in soothing abdominal pain [40, 41].

The use of calming herbs such as lemon balm, coriander, and thyme may not only improve bloating but also reduce anxiety and enhance the quality of infant sleep. These plants help modulate colic symptoms by alleviating nervous tension and supporting digestive function [42, 43].

Beyond oral preparations, topical application of herbal oils has also garnered attention in traditional medicine [44]. Gentle stimulation of intestinal peristalsis with oils such as sweet almond, olive, lavender, and coconut stimulates local blood circulation and reduces muscular spasms in the abdomen, thus contributing to relief from gastrointestinal discomfort [45–47]. Lavender essential oil, in particular, is noted for its calming fragrance and anti-inflammatory properties, which can promote relaxation and reduce irritability in infants [47]. Importantly, herbal distillates are used in diluted form to minimize the risk of adverse reactions in sensitive neonates. Following oral administration of diluted herbal distillates, topical application of herbal oils on the infant's abdomen serves as a complementary strategy to support health and ease symptoms. In many diseases and disorders [48-52], turning to nature and embracing traditional or natural therapeutic approaches can serve as a beneficial and complementary strategy helping to alleviate symptoms, support overall well-being, and enhance patients' quality of life [53]. The active compounds and antioxidants found in medicinal plants play a vital role in preventing and treating inflammatory, infectious, cardiovascular diseases, and even cancers by neutralizing free radicals and strengthening the immune system [54-56].

Conclusion

Taken together, the existing evidence suggests that traditional medicine holds considerable potential for managing abdominal distension through the use of medicinal plants, provided their application is evidence-based, carefully controlled, and adheres to safety principles. Educating families, updating physicians' knowledge, and developing clinical guidelines are critical steps to promote the correct and effective use of these therapeutic approaches.

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Competing interests

The authors have no competing interests to declare that are relevant to the content of this article.

Ethics approval

This study was performed in line with the principles of the Declaration of Helsinki.

Consent to participate

Informed consent was obtained from all individual participants included in the study.

Author contributions

SN: Conceptualization, the original draft writing, investigation, writing including reviewing and editing and investigation and formal analysis; NGH: Conceptualization, supervision, and project administration; SN and NGH Conceptualization, the original draft writing, investigation, writing including reviewing and editing.

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