



Current view on the problem of treating fibrocystic breast disease in terms of herbal medicine

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Abstract

Introduction: Fibrocystic breast disease, commonly called fibrocystic breasts or fibrocystic change, is a benign (non-cancerous) condition, which is the most common pathology in women of reproductive age. Treatment of fibrocystic breast disease and concomitant pathologies can involve using herbs.

Materials and Methods: To make an analysis of literary sources on the development of fibrocystic breast disease in the pathogenesis of diseases of the female reproductive system (clinical human (75%) and animal studies (25%)) were published in the period of 2017–2021.

Results and discussion: The diversity of plants in the world is a promising ground for therapeutic improvisation, allowing for an individual approach to each patient, but, most importantly, creates possibilities for maneuvering in the event of ineffectiveness of any means. In some situations, herbal medicine is not only possible or permissible, but strictly mandatory, and is essentially the only effective therapeutic method, which is relatively safe provided the correct selection of combinations and control by a doctor who applies a certain method of phytotherapy, especially given a duration of treatment. The need for a deeper study is long overdue for the pharmacological capabilities of various plant raw materials in the treatment of not only this pathology, but others as well.

Conclusion: The development of phytotherapy should be based primarily on scientific developments, but this area can not be considered the prerogative of only phytotherapists, as herbal medicines should be in the arsenal of doctors of all specialties.

Keywords

fibrocystic breast disease, phytotherapy, gonadotropic effect, herbal preparations, hepatobiliary system.

Introduction

Fibrocystic breast disease, commonly called fibrocystic breasts or fibrocystic change, is a benign (noncancerous) condition, which is the most common pathology in women of reproductive age. According to the WHO

classification, fibrocystic breast disease is characterized by a wide range of proliferative and regressive changes in breast tissue. The incidence of this disease ranges from 30 to 50%, according to different literary sources (Malherbe et al. 2021). In the group of women who have any gynecological pathology, this figure increases to 60–70%

(Stachs et al. 2019). If the disease is not treated in time, it can turn from proliferative and regressive changes into metaplasia and dysplasia (varies widely from 0.2% to 30% depending on the form) (Kowalski and Okoye 2021). The likelihood of malignancy of fibrocystic breast disease (transition to cancer) is 0.5–1.0%. In case of special histological variants, for example, intracanalicular, it is 2 times higher; with phylloid tumors, it is 7.5 times higher (Roman et al. 2021).

Breast cancer by a wide margin leads among all types of oncopathology in women (Louro et al. 2020). The urgency of the problem has been beyond doubt for a long time. However, conservative treatment of women with fibrocystic change is now quite rare and limited to general recommendations, despite the fact that the symptoms have been known for over a hundred years, and it still remains the most common breast disease. For the most part, such women belonged to the groups that were passively observed. Active actions most often begin when the process acquires clearly malignant features: rapid growth of the node, changes in the configuration of the glands, nipples, skin of the gland and the like (Talaei et al. 2017). At the same time, phytotherapy is able to offer a method of solution to the problem at all stages of its development. Patients with fibrocystic breast disease are quite actively looking for alternative treatments, communicate with one another on various Internet forums, use advice of friends or acquaintances. In our opinion, some of these methods have no basis for use in this case, and some of them are very dangerous (Kunicki and Smolarczyk 2021).

Thus, the development and improvement of the scientific base of phytotherapy of various forms of fibrocystic breast disease, taking into account a comprehensive approach to the treatment of underlying and related pathologies, as well as the systematization of existing experience is a very important and promising task.

The aim of the study: to analyse and generalize the data from professional literature and own experience in the treatment of patients with various forms of fibrocystic breast disease by phytotherapeutic methods, taking into account the influence of medicinal plants on various links in the pathogenesis of the disease, as well as to develop recommendations for the improvement and the use of phytotherapy in the treatment of this pathology.

Materials and methods

To make an analysis of literary sources on the development of fibrocystic breast disease in the pathogenesis of diseases of the female reproductive system. Most analyzed studies were clinical human (75%) and animal studies (25%), aimed at various issues – fibrocystic breast disease, hyperestrogenemia, progesterone deficiency, hyperprolactinemia, diseases of the liver and gallbladder, and influence of medicinal plants on the course of the disease in various forms of fibrocystic breast disease. Based on the time of publication of papers, most of the selected

studies were published in the period of 2017–2021, with a notable intensification of publications observed from 2019 to 2021.

Results and discussion

Etiology and pathogenesis of fibrocystic breast disease

The main cause of pathologies of the mammary glands, in particular fibrocystic breast disease, are hormonal disorders in women. It is well known that the development of mammary glands, regular cyclical changes in them in adulthood, as well as changes in their functions during pregnancy and lactation, occur under the influence of a complex of hormones: gonadotropin-releasing hormone of the hypothalamus, gonadotropic hormones of the pituitary gland, prolactin, thyroid-stimulating hormone, androgens, corticosteroids, insulin, estrogen, and progesterone. Any hormonal imbalance is accompanied by dysplastic changes in breast tissue. The **etiology and pathogenesis of fibrocystic breast disease** have not yet been definitively established, although more than a hundred years have passed since the symptoms were first described. Relative or absolute hyperestrogenemia and progesterone deficiency play an important role in the pathogenesis of this condition. Estrogens are known to cause proliferation of alveolar epithelium in the ducts and stroma of the mammary glands, whereas progesterone, which is an antagonist of these processes, provides differentiation of the epithelium and cessation of mitotic activity. Progesterone deficiency is accompanied by edema and hypertrophy of connective tissue within the lobes of the gland, and the proliferation of duct epithelium leads to the formation of cysts (Adhikary et al. 2020).

Most authors found progesterone deficiency in fibrocystic breast disease, while in other studies its level was found to fall within normal limits. In addition, an increase in prolactin levels plays an important role in the development of this pathology, accompanied by thickening, soreness of the mammary glands, and edema. These symptoms are more pronounced in the second phase of the menstrual cycle. Hormone imbalance in a woman's body can cause gynecological diseases, sexual disorders, thyroid dysfunction, pathology of the liver and bile ducts, pregnancy and childbirth, and stressful situations. It is necessary to take into account the possible heredity of the disease. Often fibrocystic breast disease develops during menarche or menopause. A diffuse type of pathology is most common in adolescence and in young women. It is characterized by insignificant clinical manifestations and moderate pain in the mammary glands. At the age of 30–40, multiple small cysts with a predominantly glandular component are most often found, with the pain syndrome being usually considerably expressed. Single large cysts are more common in patients aged 35 years and older (Zendehdel et al. 2018).

Therefore, given the pathogenesis of the disease and the main dys hormonal changes that lead to fibrocystic breast disease, it is possible to draw a conclusion, that treatment should include the following areas: normalization of disorders of the endocrine system, direct effect on the tumor, immunomodulation, treatment of thyroid diseases, regulation and stabilization of metabolic processes in the body, treatment of diseases of the liver and gallbladder, elimination of venous stasis in the pelvis, elimination of the syndrome of dysbacteriosis of the colon, antidepressant and sedative therapy, and replenishment of deficiency of vitamins and minerals (Kerekes et al. 2018).

Basic principles of phytotherapy of fibrocystic breast disease

We identified the following **basic principles of phytotherapy**. In the early stages of fibrocystic breast disease, when the clinical situation is characterized by minor diffuse changes in the mammary glands, coinciding in time with menstruation, accompanied with pain, treatment can be limited to the use of combinations of medicinal herbs, which were selected taking into account all the therapeutic areas. In cases when such a treatment is ineffective, as well as in nodular fibrocystic breast disease, the basis of treatment should be gonadotropic herbs, powerful plant immunomodulators and herbs with a direct effect on the benign tumor. Each gonadotropic plant has its own indications for use, and therefore it is important which of them will be assigned in different cases. The use of all tinctures must be supplemented by the prescription of a decoction of herbs carefully selected, taking into account all possible directions of treatment. In addition to taking medication orally, it is also necessary to use external herbal remedies – ointments, plasters, lotions and more. Treatment should be long, planned, involving all the available means and methods to control efficacy (Godazandeh et al. 2021).

According to most authors, the full course of treatment consists of three cycles of 30–40 days and two breaks between them, each of them equal to two weeks. In our opinion, taking into account the experience of treating the breast pathology, the sufficient duration of the cycle can be 28 days (coincides with the duration of the menstrual cycle), and the duration of the break between the cycles is 3–5 days (duration of the menstruation). If the treatment during the main course was effective, with lumps in the mammary glands having disappeared, but there are still some menstrual disorders or other symptoms of a concomitant pathology, the treatment is to be continued without interruption. At the same time, taking any potent tinctures should be terminated, with only herbal collections being still applied. The duration of such a course is determined individually. In case of ineffectiveness of the main course, it is recommended to continue the treatment, but with changing the prescribed tinctures of gonadotropic and antitumor plants (Appleton 2018).

Gonadotropic plants for treatment fibrocystic breast disease

Gonadotropic plants are herbs that through various mechanisms selectively act on the gonads. When distinguishing these plants into a separate group, it is necessary to take into account the facts: effect on the sexual sphere can vary depending on a type of the plant. Some herbs stimulate the production of hormones, others suppress them, and still others regulate their ratio. Herbs also have a mixed effect on other genital functions, such as the uterine muscle tone (Arentz et al. 2017).

The mechanisms of action of gonadotropic plants are mostly not yet recognized, and do not always directly affect the gonads. It is likely that their action is mediated, for example, through the hypothalamus or thyroid gland. Like the vast majority of herbs, gonadotropic plants, in addition to their pronounced effect, have many other useful properties, for example, *Pulsatilla pratensis* has sedative and hypnotic effects and is a powerful antifungal agent (Zhu et al. 2020).

Gonadotropic plants can be divided into two major groups – **poisonous** (or potent) and ordinary (**non-poisonous**). Such a division is of direct practical significance. The first group of plants is characterized by a rapid onset of therapeutic effect, this effect is resistance to a relatively short-term treatment. However, these plants are very toxic (*Conium maculatum*, colloquially known as hemlock, poison hemlock or wild hemlock, is a highly poisonous biennial herbaceous flowering plant in the carrot family Apiaceae, native to Europe and North Africa) and have many side effects. The optimal dosage form for poisonous plants is an alcohol tincture with a drip dosing regimen (Chizzola and Lohwasser 2020).

The main representatives of this group are: *Anemone pratensis* L. (*Pulsatilla pratensis* L.), Black cohosh daurian (*Cimicifuga dahurica*), Spotted or poison hemlock (*Conium maculatum*), and Twisted birthwort (*Aristolochia contorta*). In our opinion, poisonous plants can be used only in isolated cases, when all possible dangerous consequences and benefits of their use are well understood (the so-called benefit/danger ratio). Based on our experience in the treatment of fibrocystic breast disease, we generally restrain from using potent plants in any form and under any circumstances, believing that among the common non-poisonous plants there are a large number of fairly active ones and safe to use, which allows for an individual approach to make a very effective composition both for the treatment of the underlying pathology and for the elimination of comorbidities (Mezzasalma et al. 2017).

The **second group** consists of ordinary (or **non-poisonous**) herbs which act more slowly, and the stabilization of their therapeutic effect occurs later than when using poisonous herbs. But the action of this group of herbs is milder, gentler, gives a minimum of side effects, which is important for patients with comorbidities. Ordinary herbs are usually characterized by a wider range

of therapeutic effect on the patient's body. For the most part, they combine well with other herbs in the assembly. The optimal dosage forms are decoctions and infusions. The main representatives are: Common hoarhound (*Marrubium vulgare*), European bugleweed (*Lycopus europaeus*), *Angelica archangelica* L. (*Archangelica officinalis* (Moench.)), *Ixiolirion tataricum*, (commonly known as the Siberian lily or the lavender mountain lily), Common oregano (*Origanum vulgare* L.), and Common hornbeam (*Carpinus betulus* L.) (Khan et al. 2019).

Of particular note are **walnut leaves** (*Juglans regia* L.), which contain tannins (3–4%), glycosides, flavonoids, essential oil, juglon, inositol, carotenoids, **vitamins C, B1, P**, and a lot (up to 30%) of provitamin A. Long-term observations and the introduction of walnut leaves in a combination of herbs for the treatment of fibrocystic breast disease significantly increases the efficacy of treatment. The mechanism of action of walnut leaves in a combination of herbs is apparently associated with stimulation of dopamine receptors and a decrease in blood prolactin levels. Empirically, we came to the conclusion: given the fact that along with **Ordinary hops** (*Humulus lupulus* L.) and **Common Sage** (*Salvia officinalis* L.), infusion of walnut leaves inhibits lactation. Ordinary hops (*Humulus lupulus* L.) have possible gonadotropic effects – estrogenic and progestogenic, a depressing effect on lactation, a stimulating effect on the myometrium tones, and an inhibiting effect on libido resulting in its decrease. Common Sage (*Salvia officinalis* L.) has a possible gonadotropic effect – estrogenic, a depressing effect on lactation, whereas no effect on the either myometrium or libido was expressed (Gutierrez et al. 2018).

However (unlike the first two plants), walnut leaves do not show an estrogenic effect, and in large doses cause vomiting, which may be due to stimulation of dopamine receptors “start zone” of the vomiting center. In Ukrainian folk medicine, steamed walnut leaves are recommended for the treatment of swelling of the mammary glands, and the infusion is taken orally to stop lactation. Which of the substances contained in the leaves of the walnut are active in fibrocystic breast disease is still unknown. We believe that the active substance is primarily **juglone**, but this requires certain pharmacological studies. **Juglone**, also called **5-hydroxy-1,4-naphthalenedione**, is an organic compound with the molecular formula $C_{10}H_6O_3$. It is insoluble in benzene but soluble in **dioxane**, from which it crystallizes as yellow needles. It is an isomer of lawsone, which is the staining compound in the henna leaf (Fernandez-Agullo et al. 2019).

Yellow Marsh marigold (*Acorus calamus*), also called sweet flag, sway or muskrat root, among many common names, is a species of flowering plant with psychoactive chemicals. It is a tall wetland monocot of the family Acoraceae, in the genus *Acorus*. Although it has been used in traditional medicine for over centuries to treat digestive disorders and pain, there is no clinical evidence of its safety or efficacy, and, when ingested, calamus may be toxic, which led to its commercial ban in the

United States. It has a possible gonadotropic effect – androgenic, whereas its effect on lactation is not expressed; it causes the relaxation of the myometrium and increases libido (Khawairakpam et al. 2018).

Pimpinella anisum (*Anisum vulgare* Gaerth.), also called aniseed, is a flowering plant in the family Apiaceae native to the eastern Mediterranean region and South-west Asia. The flavor of its seeds have similarities with those of some other spices, such as star anise, fennel, and liquorice. It is widely cultivated and used to flavor food, candy, and alcoholic drinks, especially around the Mediterranean. It has a possible gonadotropic effect – estrogenic, an intensifying effect on lactation, a relaxing effect on the myometrium, whereas no effect on libido is expressed (Kargozar et al. 2017).

Verbena medicinal (*Verbena officinalis* L.), the common vervain or common verbena, is a perennial herb native to Europe. It grows up to 70 cm high, with an upright habitus. The lobed leaves are toothed, and the delicate spikes hold clusters of two-lipped mauve flowers. This plant prefers limey soils; it is occasionally grown as an ornamental plant, but perhaps more often – for the powerful properties some herbalists ascribe to it. Propagation is by root cuttings or seed. It is widely naturalised outside its native range, for example in North America. Its possible gonadotropic effect is androgenic; no effect on lactation is expressed, it has a tonifying effect on the myometrium and an increased effect on libido (Kubica et al. 2020).

Lilac carnation (*Dianthus campestris*), commonly known as the carnation or clove pink, is a species of *Dianthus*. It is probably native to the Mediterranean region, but its exact range is unknown due to extensive cultivation for the last 2,000 years. It has a possible gonadotropic effect – androgenic; it has a tonifying effect on the myometrium, whereas no effects either on lactation or on libido are expressed (Yoon et al. 2019).

Sweet clover (*Melilotus officinalis* L.), known as sweet yellow clover, yellow melilot, ribbed melilot and common melilot, is a species of legume native to Eurasia and introduced in North America, Africa, and Australia. *Melilotus officinalis* can be an annual or biennial plant and is 4–6 feet (1.2–1.8 m) high at maturity. Leaves alternate on the stem and has three leaflets. Yellow flowers bloom in spring and summer and produce fruit in pods typically containing one seed. Seeds can be viable for up to 30 years. Plants have large taproots and tend to grow in groups. Plants have a characteristic sweet odor. Neither its possible gonadotropic effect nor an effect on libido is found, but it has an intensifying effect on lactation and a relaxing effect on the myometrium (Paun et al. 2020).

Common oregano (*Origanum vulgare* L.) is a species of a flowering plant in the mint family Lamiaceae. It was native to the Mediterranean region, but is now widely naturalised elsewhere in the temperate northern hemisphere. Oregano is a woody perennial plant, growing 20–80 cm tall, with opposite leaves of 1–4 cm long. The flowers are purple, 3–4 mm long, produced in erect spikes in summer. It is sometimes called wild marjoram, and is its

close relative. *O. majorana* is known as sweet marjoram. Both are very widely used as culinary herbs, especially in Spanish, Italian and French cuisines. Oregano is also an ornamental plant, with numerous cultivars bred for varying leaf colour, flower colour and habit. It has a possible gonadotropic effect – estrogenic, an intensifying effect on lactation, a tonifying effect on the myometrium, but a decreased effect on libido (Oniga et al. 2018).

Meadow clover (*Trifolium pratense* L.), the red clover, is a herbaceous species of flowering plant in the bean family Fabaceae, native to Europe, western Asia, and northwestern Africa, but is now planted and naturalized in many other regions. Red clover is a herbaceous, short-lived perennial plant, variable in size, growing up to 20–80 cm tall. It has a deep taproot which makes it tolerant to drought and gives it a good soil structuring effect. The leaves are alternate, trifoliate (with three leaflets), each leaflet 15–30 mm long and 8–15 mm broad, green with a characteristic pale crescent in the outer half of the leaf; the petiole is 1–4 cm long, with two basal stipules that are abruptly narrowed to a bristle-like point. The flowers are dark pink with a paler base, 12–15 mm long, produced in a dense inflorescence, and are mostly visited by bumblebees. It has a possible gonadotropic effect – estrogenic and arelaxing effect on the myometrium, whereas neither effect on lactation nor effect on libido is expressed (Myers and Vigar 2017).

Silverweed (*Potentilla anserina* L.), or *Argentina anserina*, is a perennial flowering plant in the rose family, Rosaceae. It is also known by the common names – common silverweed or silver cinquefoil. It is native throughout the temperate northern hemisphere, can be often found on river banks and in grassy habitats, such as meadows and road-sides. The plant was originally placed in the genus *Potentilla* by Carl Linnaeus in his “Species Plantarum”, edition 1, in 1753, but was reclassified into the resurrected genus *Argentina* by research conducted in the 1990s. The reclassification remains controversial and is not accepted by some authorities. It is a species aggregate which has been frequently divided into multiple species. It has a possible gonadotropic effect – progestogenic, a relaxing effect on the myometrium, but neither effect on lactation nor effect on libido is expressed (Shi et al. 2020).

Loquat medicinal (*Levisticum officinale* L.) is a tall perennial plant, the sole species in the genus *Levisticum* in the family Apiaceae, subfamily Apioideae. It has been long cultivated in Europe, with its leaves being used as a herb, roots as a vegetable, and seeds as a spice, especially in the southern European cuisine. It has a possible gonadotropic effect – androgenic, a relaxing effect on the myometrium, an increased effect on libido, but no effect on lactation is expressed (Amraie et al. 2020).

Comfrey medicinal (*Symphytum officinale*) is a perennial flowering plant in the family Boraginaceae. Along with thirty-four other species of *Symphytum*, it is known as comfrey. To differentiate it from other members of the genus *Symphytum*, this species is known as common comfrey or true comfrey. Other English names include Quak-

er comfrey, cultivated comfrey, boneset, knitbone, con-sound, and slippery-root. It is native to Europe, growing in damp, grassy places. It is locally frequent throughout Ireland and Britain on river banks and in ditches. It can be found elsewhere, including North America, as an introduced species and sometimes a weed. The flowers are mostly visited by bumblebees. Internal or long-term topical use of comfrey is discouraged due to its strong potential to cause liver toxicity. Its possible gonadotropic effect is expressed in an antihormonal activity; it has a tonifying effect on the myometrium, but neither effect on lactation nor effect on libido is expressed (Salehi et al. 2019).

Curly parsley, seeds (*Petroselinum crispum* M.) is a genus of two species of flowering plants in the family Apiaceae, native to western and southern Europe and northern Africa. They are bright green hairless biennial herbaceous plants, rarely annual plants. In the first year, they form a rosette of pinnate to tripinnate leaves and a taproot used as a food store over the winter. In the second year they grow a flowering stem up to 1 m tall with sparser leaves and umbels of white or pinkish to yellowish-green flowers. *Petroselinum crispum* (garden parsley) from southern Europe and northern Africa (southern Italy, Greece, Algeria, Tunisia) is an important culinary herb, widely used for flavouring and as a vegetable. It has a possible gonadotropic effect – androgenic, an intensifying effect on lactation, a tonifying effect on the myometrium, and an increased effect on libido (Salahshoor et al. 2020).

Common wormwood (*Artemisia vulgaris* L.) is a species of flowering plant in the daisy family Asteraceae. It is one of several species in the genus *Artemisia* commonly known as mugwort, although *Artemisia vulgaris* is the species most often called mugwort. It is also occasionally known as riverside wormwood, felon herb, chrysanthemum weed, wild wormwood, old Uncle Henry, sailor’s tobacco, naughty man, old man, or St. John’s plant. Mugworts have been used medicinally and as culinary herbs. It has a possible gonadotropic effect by stimulating the synthesis of follicle-stimulating hormone in the pituitary gland, a tonifying effect on the myometrium, but neither effect on lactation nor effect on libido is not expressed (Abiri et al. 2018).

Flavoring celery (*Apium graveolens* L.) is a marshland plant in the family Apiaceae that has been cultivated as a vegetable since ancient times. Celery has a long fibrous stalk tapering towards leaves. Depending on location and cultivar, either its stalks, leaves or hypocotyl can be eaten and used in cooking. Celery is also used as a spice and its extracts have been used in herbal medicine. It has a possible gonadotropic effect – androgenic, a relaxing effect on the myometrium, an increased effect on libido, but no effect on lactation is expressed (Hedayati et al. 2019).

Liquorice or licorice is the common name of *Glycyrrhiza glabra*, a flowering plant of the bean family Fabaceae, from the root of which a sweet, aromatic flavouring can be extracted. The liquorice plant is a herbaceous perennial legume native to western Asia, North Africa,

and southern Europe. Botanically, it is not closely related to anise or fennel, which are sources of similar flavouring compounds. Liquorice is used as a flavouring in candies and tobacco, particularly in some European and West Asian countries. Liquorice extracts have been used in herbalism and traditional medicine. Excessive consumption of liquorice (more than 2 mg/kg per day of pure glycyrrhizinic acid, a liquorice component) may result in adverse effects, such as hypokalemia, increased blood pressure, muscle weakness, and even death. *Glycyrrhiza glabra* has a possible gonadotropic effect – estrogenic, glucocorticoid and mineralocorticoid, a tonifying effect on the myometrium, and increased effect on libido, but no effect on lactation is expressed (Pastorino et al. 2018).

Blue devils (*Echium vulgare*), known as viper's bugloss and blueweed, is a species of flowering plant in the borage family Boraginaceae. It is native to most of Europe and western and central Asia, and it can be found as an introduced species in north-eastern North America. The plant root was used in ancient times as a treatment for snake bites. If eaten, the plant is toxic to horses and cattle due to the accumulation of pyrrolizidine alkaloids in the liver. It is a biennial or monocarpic perennial plant growing to 30–80 cm tall, with rough, hairy, oblanceolate leaves. The flowers start pink and turn vivid blue, and are 15–20 mm in a branched spike, with all the stamens protruding. The pollen is blue, but the filaments of the stamens remain red, contrasting against the blue flowers. It flowers between May and September in the northern hemisphere. Its possible gonadotropic effect is expressed in the antiestrogenic activity, it has a tonifying effect on the myometrium, whereas neither effect on lactation nor effect on libido is expressed (Dresler et al. 2017).

Dill (*Anethum graveolens* L.) is an annual herb in the celery family Apiaceae. It is the only species in the genus *Anethum*. Dill is grown widely in Eurasia, where its leaves and seeds are used as a herb or spice for flavouring food.

Fennel (*Foeniculum vulgare* M.) is a flowering plant species in the carrot family. It is a hardy, perennial herb with yellow flowers and feathery leaves. It is indigenous to the shores of the Mediterranean but has become widely naturalized in many parts of the world, especially on dry soils near the sea-coast and on riverbanks. It is a highly aromatic and flavorful herb used in cooking and, along with the similar-tasting anise, is one of the primary ingredients of absinthe. Florence fennel or finocchio is a selection with a swollen, bulb-like stem base that is used as a vegetable. It has no possible gonadotropic effect, an intensifying effect on lactation, a relaxation effect on the myometrium, though no effect on libido is expressed (Idiz et al. 2018).

Field Pennycress (*Thlaspi arvense* L.) is a flowering plant in the cabbage family Brassicaceae. This plant comes from Eurasia, and is a common weed throughout much of North America and its home. *Thlaspi arvense* is a foetid, hairless annual plant, growing up to 60 cm tall, with upright branches. The stem leaves are arrow-shaped, narrow and toothed. It blooms between May and July, with racemes or spikes of small white flowers that have 4

sepals and 4 longer petals. Later it has round, flat, winged pods with a deep apical notch 1 cm across. They contain small brown-black seeds. The common name pennycress is derived from the shape of seeds looking like an old English penny. Other English common names are: stinkweed, bastard cress, fanweed, field pennycress, frenchweed, and mithridate mustard. It has a possible gonadotropic effect – androgenic, an increased effect on libido, but neither effect on lactation nor effect on the myometrium is expressed, (Tsogtbaatar et al. 2020).

Role of the disorders of the hepatobiliary system in the development of fibrocystic breast disease

Disorders of the hepatobiliary system play a special role in the development of fibrocystic breast disease. According to our observations, the vast majority of women suffering from fibrocystic breast disease (and, incidentally, uterine fibroids, also called leiomyomas) complain of unstable bowel movements and a tendency to constipation, which is obviously associated with liver pathology and impaired production and secretion of bile. Liver dysfunction leads to a decrease in the synthesis of proteins that bind hormones, as a result of which a free fraction of hormones in the blood increases. This leads to extraglandular dyshormonosis or endocrinopathies, which are the basis of fibrocystic changes. Liver dysfunction affects the intensity of estrogen metabolism. The destruction of estrogen is delayed, and under the condition of normal production of hormones by the ovaries, this leads to hyperestrogenemia. The combined dysfunction of the liver and gallbladder leads to insufficient emulsification of fats that come with food. This complicates the breakdown and absorption of fats and leads to a deficiency of sources for synthesis of steroid hormones and hypovitaminosis of A, E, D, and K. **Vitamin E**, as a powerful antioxidant, prevents the development of local tissue hypoxia, thereby limiting proliferative and fibrotic processes in breast tissue (Gonzalez-Brown and Frey 2020).

All the above brings out a list of therapeutic measures: ensuring a normal liver function, protection of liver cells with hepatoprotectors from toxic effects inside and outside; normalization of physicochemical properties of bile, conditions of its maturation and outflow, for which purpose choleric and antispasmodic herbs are used. The herbs that have a hepatoprotective effect are the following well-known plants: **Milk thistle (*Silybum marianum*)**, **Common chicory (*Cichorium intybus*)**, and **Dandelion (*Taraxacum officinale*)**. Besides, **Calendula (*Calendula officinalis*)** is not inferior in its beneficial effects on the liver to many of the above plants. The vast majority of hepatoprotectors also have a choleric effect (Meng et al. 2020).

In all herbal preparations for the treatment of fibrocystic breast disease with no exception (if there is no history of allergies), we use cumin. Caraway, also known as meridian fennel and **Persian cumin (*Carum carvi*)**, has no possible gonadotropic effect, an intensifying effect on lactation, a relaxing effect on the myometrium, whereas

no effect on libido is expressed. Cumin flower baskets contain essential oil (0.05%), flavonoids (apigenin, naringenin, kaempferol, etc.), vitamins (C, K), carotene, organic acids, polysaccharides (3.5–5.5%), steroid compounds, resins, macromolecular alcohols, mucus, bitter and tannins, sulfates and chlorides of potassium, calcium, iron and manganese. According to our observations, this is the most active and safe means of normalizing the liver function, and in fairly high doses causes a pronounced hepatoprotective effect (Khatamian et al. 2019).

In addition, a mandatory component of the compositions for the treatment of fibrocystic breast disease is *Chelidonium majus* (celandine, common celandine, greater celandine), which contains alkaloids: chelidonine, homochelidonine, oxychelidonine, protopine, allocryptonine, berberine, sparteine; organic acids – malic, citric, chelidonic; traces of essential oil, gum and resin. Celandine herb also contains choline, methylamine, histamine, tyramine, saponin, flavones, vitamin C (up to 180 mg), carotene (up to 10 mg), minerals – silicon, iron, calcium, magnesium, phosphorus, sulfur, chlorine, aluminum, and radioactive potassium. We consider celandine a very effective cholagogue, which, according to some data, has a cytostatic effect, which can be very useful in the case of severe proliferative changes in the mammary glands (Maggini et al. 2019).

Given the significant influence of the central nervous system on the functioning of various organs and systems, in order to normalize the processes of excitation and inhibition in the cerebral cortex, in our opinion, the phytotherapy of fibrocystic breast disease should include sedatives. We usually recommend Motherwort herb (*Leonurus cardiaca*), which contains essential oils, glycosides, alkaloids, flavonoids, bitters, tannins, organic acids, sugars and minerals, vitamins A and C. Motherwort generally combines well with other herbs and enhances their main effect (Yu et al. 2019).

Further tactics in the treatment of patients with fibrocystic breast disease largely depends on the obtained effects. In cases where a stable therapeutic effect is achieved, we can propose to stop taking medicinal herbal preparations and resume it for preventive purposes twice a year during the off-season periods (spring and autumn). Preventive courses of treatment do not require the use of poisonous and potent drugs; they are limited only to using a mix of safe medicinal herbs. Such courses are prescribed for 1.5–2 months. An obligatory condition in the strategy of treating fibrocystic breast disease, in our opinion, is prescribing an anti-relapse treatment using constitutional medicines that allow compensating for an innate genetic predisposition to a particular pathology,

in this case, a predisposition to a pathology of the mammary glands. This topic is quite extensive and complex, but, despite this, it is well covered in modern literature, so this issue is not discussed here. If the treatment during the main course was effective, with the disappearance of lumps from the mammary glands, but any menstrual disorders, manifestations of thyroid dysfunction or other symptoms of concomitant pathologies remain, the treatment continues without interruption. The duration of such a course is determined individually. If the effect of the main course is insufficient and unstable, then it is recommended to continue the treatment according to the previous plan, changing the prescribed gonadotropic and antitumor plants. And finally, in cases where the herbal treatment has proved ineffective, it is necessary to resort to hormone therapy or surgical treatment.

Thus, the diversity of the plants in the world is a promising ground for therapeutic improvisation, allowing for an individual approach to each patient, but, most importantly, it creates possibilities for maneuver in the event of ineffectiveness of any means.

Conclusion

Treatment of fibrocystic breast disease and concomitant pathologies is quite possible with the use of herbs. In some situations, herbal medicine is not only possible or permissible, but strictly mandatory, and is essentially the only effective therapeutic method, but, moreover, a relatively safe one provided the correct combinations are selected and controlled by a doctor with a proper qualification in phytotherapy, especially given the duration of treatment. The need for a deeper study has been in demand for long due to the pharmacological capabilities of various plant raw materials in the treatment of this pathology among others. The development of phytotherapy should be based primarily on scientific developments, so this area can not be considered to be the prerogative of only phytotherapists; thus, doctors of all specialties should be qualified to apply herbal medicines.

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Conflict of interests

The authors declare no conflict of interests.

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