REVIEW

Balneogynaecology in the 21st century: increasingly recommended primary and complementary treatment of chronic gynaecological diseases

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ABSTRACT

Balneo-gynaecological treatment methods include external bath hydrotherapy, sedentary baths and topical dressings/cataplasm, and internal (intravaginal or intrarectal use of peloids and mineral water). Hyperosmolar thermal spas have been very popular in the treatment of infertility due to the improvement of symptoms of chronic pelvic pain, endometriosis, chronic vascular and inflammatory pelvic diseases. Acute pelvic inflammatory syndrome is a contraindication for balneo-hydrotherapy while hyperthermal hydrotherapy is contraindicated in endometriosis and neurovegetative dystonia due to the stimulation of hyperemia, which worsens the clinical picture. Balneo-hydrotherapy is not recommended in metrorrhagia and malignancies. Balneogynaecological treatment certainly has its own primary but also complementary role in the treatment of chronic gynaecological diseases and is increasingly recommended today.

Key words: complementary therapies, hydrotherapy, mud therapy

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INTRODUCTION

The climatotherapeutic characteristics of individual areas have established numerous natural spas based on climate, mineral and medicinal water sources, and medicinal peloids. Natural spas are most commonly called baths on land and coast (thalassotherapy). There are numerous records in the history of medicine noticed by Hippocrates, Asclepiades, Galen and others, that indicate the good effects of naturopathic treatments, which in addition to the healing properties of natural resources, included hygienic components too (1-3).

Gynaecological balneotherapy (balneo-gynaecology) as a method of therapy has been described throughout the history of medicine and civilization, firstly empirically and scientifically evaluated by ancient physicians, then pre-renaissance period (Trotula Salernitana), following the development of iatrophysics and iatrochemistry through the centuries (1). Physicochemical analysis of climatological and balneological conditions, alongside with monitoring of the effects of a treatment, have scientifically established indications for the treatment of numerous diseases, including gynaecological ones (3,4) (Table 1).

This review offers an insight into balneo-gynaecological methods in modern gynaecology in the 21st century.

BIOCHEMICAL AND PATHOPHYSIOLOGICAL EFFECTS OF BALNEOTHERAPY

The changes of individual biochemical markers, such as cortisol, an increase of sodium, potassium and calcium concentrations in blood, have especially been demonstrated in hydrotherapy procedures, in addition to hydrostatic pressure that regulates extra and intravascular fluid with increased diuresis, decreased blood pressure and decreased oedema (2-11). All these changes of biochemical markers level have positive effects on muscle relaxation, vasodilation and reduction of painful conditions (9). Balneotherapy procedures in particular reduce inflammatory cytokine response and adhesion formation, and they are especially used in rheumatology, rehabilitation (including chronic pain conditions and fibromyalgia), followed by postoperative recoveries where they have a proven antiadhesive effect (2-11). Hyperthermal spa therapy causes local vasodilation and muscle relaxation, while reducing tension and pain, plus hot submersion, reduces the production of stress hormones. Hydrotherapy in warm alkaline - chlorine mineral water has been shown to reduce the enzymatic activity of catalase (12) and to modulate serotonin platelet transmission in healthy populations (13). Balneotherapy thus uses the healing properties of natural healing factors of mineral waters and mud such as temperature, ionization, composition of microelements and organic substances (13). Today, in addition to balneotherapy (spa therapy), other naturopathic and physical therapy methods are used as complementary to the therapeutic, rehabilitation and relaxation anti-stress programs (massage, psychotherapy, dietetics, phytotherapy, heliotherapy, acupuncture) (1,2,5,6,10,11, 14-16).

BALNEOTHERAPY PROCEDURES

Balneotherapy procedures have a biphasic stimulating effect of hormesis with proven biochemical and pathophysiological effects, so patients need to be informed of the mode of action via informed consent after setting an indication for

Table 1. Indications for gynaecological balneotherapy

Indication	Type of balneotherapy				
	Hydrotherapy	Sitz bad	Fango, peloid (cataplasmes)	Exercises	Intravaginal mud application
Climacterium	+	+	+	+	+
Psychosomatic disorders (premenstrual syndrome, vaginismus, dyspareunia) Neurovegetative syndrome (dystonia)	+	+	-	+	
Sterilitas, infertilitas (cervical hypersecretion, luteal insufficiency)	+	+	+	+	+
Postoperative care, reconvalescence	+	+	+		+
Chronic interstitial cystitis, chronic vulvovaginitis with pruritus	+	+	+		+
Chronic pelvic congestive syndrome (myoma, functional ovarian cysts)	+	+			+
Endometriosis	+	-	-	-	+
Chronic pelvic pain syndrome of extragenital genesis (orthopaedic)	+	+	+	+	
Chronic pelvic pain Dysmenorrhoea Vulvodynia	+	+	+		+
Vulvar craurosis and urogenital atrophia	+	+	+		+

balneo-gynaecological treatment (anamnesis, diagnostics, clinical gynaecological examination, laboratory biochemical, haematological and inflammatory parameters) (10,11, 17-22). Balneogynaecological treatment methods are external bath hydrotherapy, sedentary baths and topical dressings/cataplasm, and internal (intravaginal or intrarectal use of peloids and mineral waters). The hydromineral characteristics of spring thermal waters will dictate the indications for balneogynaecological treatment (10,11).

Local hydropathic antiphlogistic procedures

Radon water has analgesic, haemostatic, sedative and anti-inflammatory effects in the concentration of radon in water of 40-200 nCi/L (21).

Salt baths with sodium chloride water have an effect on the secretion of mineralocorticoids and glucocorticoids, and the activity to sympathetic nervous system. Salt baths with sodium chloride water have a resorptive effect while salty iodine water has an effect on congestive venous syndrome (22).

Arsenic water reduces the intensity of the oxidation-reduction processes, and the nitrogen thermal water has analgesic effects with poor fibrinolytic activity.

Iodine-bromine water is especially recommended in gynaecologic patients but precautionary measures should be taken in thyroid disease, while the carbon-acid bath is especially used in those patients (10,11,17,18, 23-28).

Sulfide water reduces the inflammatory response by reducing the exudative and infiltration components of inflammation, including the formation of a fibrotic reaction, and a sulfide concentration of 100-150 mg/L is required to treat gynaecological disorders. It is recommended for vulvodynia, vulvitis and skin diseases because it is keratolytic and keratoplastic (10,11).

Hyperosmolar (salty iodine) or aromatic baths are most commonly used, especially in chronic inflammatory and/or painful conditions.

Drinking of spring mineral waters completes balneological treatment especially for constipation that is a consequence of chronic pelvic pain and premenstrual syndrome (10,11,17,18, 23-28).

Warm/hot seating baths are not recommended in pregnancy and puerperium, whereas in I and II stage of delivery the hydrotherapy approach to childbirth (Wassergeburt) has been used for years (2,19,25,28,29). Hot sitz baths (40-46 ºC) are relaxing with antispasmodic effect reached in 3-10 minutes, neutral sitz baths (33-36 ºC) are soothing and their recommended duration is between 15 minutes to 2 hours, and cold sitz baths (12-29 ºC) are tonifying and last from 30 seconds to 8 minutes.

Local hydropathic antiphlogistic procedures are also Priesnitze wraps and cold moist wraps that help reduce congestion, tension and pain (especially used in the treatment of thrombophlebitis and mastitis) (10,11,18).

Peloid (mud) therapy

Peloids (mud), peat soil soaked in natural mineral water, are organic sludges containing large amounts of sulfides, phytoestrogens, numerous minerals and residues of organic and inorganic compounds, and are therefore particularly useful in balneogynaecology (30). Mud wrappers and cataplasms are used as well as intravaginal applications. Basically, fango is volcanic mud or paraffin sludge. Peloid baths and cataplasmas trigger the strongest reaction of the body, so it is important to recommend them after the inflammation has ended. Alternating vaginal irrigations are recommended for chronic pelvic hyperaemia. Peloid therapy (fango, mud) is recommended in chronic pelvic inflammatory disease (PID) and parametritis for 4-6 weeks. It should be applied only up to a belly height 2-3 times per week for 20 minutes. while its temperature should range from 40-42 ^{0}C (31). Fango-shaped peloids are particularly recommended in menopausal syndrome, infertility treatment, and sexual disorders such as vaginismus, dyspareunia, apareunia, and frigidity (10,31,33). Intravaginal pelotherapy uses applications heated up to 45-50 ^{0}C which are applied to the vagina for 4 hours. The vagina has thermoreceptors up to 50 ^{0}C, so by its trophotropic effect on neural plexuses and blood vessels it causes a vasodilatory effect in the small pelvis by improving the flow in the uterine artery by 50% in the first 24 hours of application. Intravaginal pelotherapy improves the tone of periurethral tissue and improves vascularization in cases of urogenital atrophy and as a result reduces urinary incontinence (10,11).

Sitz baths

Sitz baths in bitter salt (Bittersalz) are recommended when the patients suffer from dysmenorrhea, chronic pelvic pain and vaginismus, and can be used domiciliary at a temperature of 36-40 ^{0}C for 10-20 minutes (10,33). In the subacute phase of inflammatory pelvic disease, after a week of febrility, warm baths of 35-37 ^{0}C (acratotherme) up to 40 ^{0}C can be applied for 15-20 minutes alternately with mud baths 3-4 times a week. Iodine baths and radioactive baths are recommended in recurrent pregnancy loss. It is recommended to have balneo-gynaecological treatment in the spa twice a year, while some of the previously mentioned treatment methods can also be enforced at home (10,11,17,18,27,33).

Contraindications for balneotherapy

Acute pelvic inflammatory syndrome is a contraindication for balneo-hydrotherapy, while hyperthermal hydrotherapy is contraindicated in endometriosis and neurovegetative dystonia due to the stimulation of hyperaemia, which worsens the clinical picture. Balneo-hydrotherapy is not recommended in metrorrhagia and malignancies (10,11).

DISCUSSION

Taking into account previous research on balneogynaecology and its use in clinical gynaecology there is not much current research into it, while the recommendations relate to the treatment of chronic pain conditions, some forms of infertility, and functional disorders (8,10, 15-18). This has certainly been influenced by biotechnology in human reproduction and minimally invasive endoscopic surgeries in the last thirty years (2,5,6). Also, the hectic lifestyle and the expectations of patients to have a medicine to quickly resolve a gynaecological problem. On the other hand, healing effect and success of balneotherapy has remained the same (2,5,6). Chronic pelvic pain (CPP) of various aetiology, vaginal effluvium (leukorrhoea) and infertility have been the reasons and indications for the use of antiphlogistic effects of balneological treatment for centuries. Previously recurrent pregnancy losses caused by subacute and chronic endometritis, myoperimetritis, and mucopurulent cervicitis were especially treated with bath treatments. These pregnancy losses are still a problem in modern obstetrics today (1-10).

Hyperosmolar thermal spas were very popular in the treatment of infertility due to the improvement of symptoms of chronic pelvic pain, endometriosis, chronic vascular and PID, and current sporadic articles are written about this issue (19). The increase of Fallopian tubes motility and the reduction of inflammatory infiltrate are registered after hydro and pelotherapy, whereas an improvement in cervical secretion is seen after intravaginal pelotherapy (10,31,34). American authors recommended cold neutral sedentary baths for five days to menstrual period in women with uterine myomas with menometrorrhagia, followed by sulfur water baths with peloids (9), while postoperative balneotherapy thermal rehabilitation after the pelvic surgery was especially recommended (17,20,21).

The treatment with peloids (pelotherapy) by intravaginal application has been implemented for decades in gynaecology with good results, especially in the treatment of infertility and CPP (3,10,35). There is research into the healing properties of the Dead Sea peloid in the treatment of chronic endometritis and corpus luteum failure (31). Hyperosmolar healing water of the Dead Sea contains high concentrations of cations (Mg, K, ca) and anions (F, B, CL) with significant antibacterial and hyperaemic effects, especially useful in healing dermatological diseases, including vitiligo, and lichen sclerosus et atrophicus (29). Artymuk et al. have achieved a significant improvement in hormonal profile (oestrogen and progesterone elevation) with intravaginal pelotherapy of the Dead Sea peloid gel during 12 days of the menstrual cycle in luteal insufficiency, with a better Doppler sound record of the ovarian artery on the luteal side in subfertile women (31). Atkin et al. have demonstrated that continued low-level topical heat therapy has proven to be as effective in the treatment of dysmenorrhea as ibuprofen (28), while Czech authors have demonstrated the good effects of balneotherapy in paediatric gynaecological diseases, including primary dysmenorrhea (35). Rectal microclysis of mineral waters has been recommended for dysmenorrhea and cataplasm to hypochondrium (17-20, 28).

The CPP is nowadays a disease affecting 6-27% of women, and psychosomatic disorders exacerbate the clinical picture (27). Study by Min et al. suggests that balneotherapy with 10 heated sea-

water baths and 10 mud-pack applications over five days could be beneficial for patients with CPP in the short term (27). Zambo et al. (33) demonstrated the effects of a 3-week balneotherapy of alum-containing ferrous thermal water on chronic PID with 20 min baths in 38 ^{0}C water every other day, 10 sessions in total, and demonstrated a significant improvement in gynaecological findings and psychic status without influencing hormonal profile and Doppler sound parameter. Similar results in the treatment of chronic PID have been found by other authors too (31). Gerber et al. (34) found a beneficial effect of mud baths or mud packs, mineral baths, electrotherapies, and gynaecological exercises in post-PID patients with antibiotic therapy in reducing pain and insignificant motility of the Fallopian tubes. Recommendations for chronic PID is to use intravaginal 45 °C mud applications for 120 minutes with a pelotherapy 20-minute bath on every second day (10,31). Contemporary articles have suggested the reduction of size and pain of endometriotic foci through balneotherapy with high concentrations of radon water at 6.5 kBk / l (22,35). Therefore, it is evident that there is a scientific interest in complementary or primary treatment of CPP caused by endometriosis, chronic inflammatory disease or chronic varicose pelvic syndrome (36).

In conclusion, balneological treatment cannot be replaced by other forms of treatments. In recent decades gynaecological treatment has largely employed pharmacological and surgical treatments as faster and more successful methods of treating endometriosis, infertility and sterility. Nevertheless, balneological treatment certainly has its own primary but also complementary role in the treatment of chronic gynaecological diseases and is increasingly recommended today.

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