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Review

Somatocognitive therapy in the management of chronic gynaecological pain. A review of the historical background and results of a current approach

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ABSTRACT

Historic background and development of our somatocognitive approach: Mensendieck physiotherapy of the Oslo School is a tradition of physiotherapy founded by the American physician Bess Mensendieck, a contemporary and fellow student of Sigmund Freud at the Paris School of Neurology. It builds on the principles of functional anatomy and the theories of motor learning. We have further developed the theory and practice from this physiotherapy tradition, challenged by the enormous load of patients with longstanding, incapacitating pain on western health care systems, by seeking to incorporate inspirational ideas from body oriented dynamic psychotherapy and cognitive psychotherapy. We developed somatocognitive therapy as a hybrid of physiotherapy and cognitive psychotherapy by focusing on the present cognitive content of the mind of the patient, contrary to a focus on analysis of the subconscious and interpretation of dreams, and acknowledging the important role of the body in pain-eliciting defense mechanisms against mental stress and negative emotions.
The core of this somatocognitive therapy: (1) To promote awareness of own body, (2) graded task assignment related to the motor patterns utilized in daily activities, (3) combined with an empathic attitude built on dialogue and mutual understanding, and emotional containment and support. The goal is for the patient to develop coping strategies and mastery of own life. In addition, (4) manual release of tensed muscles and applied relaxation techniques are important.
Methods and results of an illustrative study: One area in particular need of development and research is sexual pain disorders. We have applied this somatocognitive therapy in a randomized, controlled intervention study of women with chronic pelvic pain (CPP). We summarize methods and results of this study. *Methods*: 40 patients with CPP were included in a randomized, controlled intervention study. The patients were randomized into (1) a control group, receiving treatment as usual (Standard Gynecological Treatment, STGT) and (2) a group receiving STGT + Mensendieck Somatocognitive Therapy (MSCT). The patients were assessed by means of Visual Analogue Scale of Pain (VASP), Standardized Mensendieck Test (SMT) for analysis of motor patterns (posture, movement, gait, sitting posture and respiration), and General Health Questionnaire (GHQ-30) assessing psychological distress, at baseline (inclusion into study), after three months of out-patient therapy and at 1 year follow-up. *Results*: The women averaged 31 years, pain duration 6.1 years, average number of previous surgical procedures 1.8 per women. In the STGT group, no significant change was found, neither in pain scores, motor patterns or psychological distress during the observation period. In the group receiving STGT + MSCT, significant reduction in pain score and improvement in motor function were found at the end of therapy, and the significant improvement continued through the follow-up (64% reduction of pain scores, and 80% increase in the average score for respiration, as an example of motor pattern improvement). GHQ scores were significantly improved for anxiety and coping ($p < 0.01$).
Conclusions: Somatocognitive therapy is a new approach that appears to be very promising in the management of chronic gynecological pain. Short-term out-patient treatment significantly reduces pain scores and improves motor function.
Implications: Chronic pelvic pain in women is a major health care problem with no specific therapies and poor prognosis. A novel, somatocognitive approach has documented positive effects. It is now studied by other clinical researchers in order to reinforce its evidence base.
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Contents

1. Introduction

1.1. The historical roots of somatocognitive therapy: Bess Mensendieck and her system of physical training

Two widely different therapeutic traditions developed from the Paris school of neurology in the early 1900s had substantial impact on the development of contemporary physical therapy as well as psychotherapy. Within this outstanding academic centre at La Salpêtrière, Duchenne made his groundbreaking studies of neurophysiology [1], describing the innervations of muscles, and Charcot taught his students basic and clinical neuropathology. Among their students were Freud, the neurologist who studied hysteric palsies [2] and then went on to formulate his famous theory on the relevance of dreams for understanding the pathology of the subconscious. Another was Bess Mensendieck, who built explicitly on Duchenne's theories of innervations of muscles of the body, and the central connections all the way up to the primary motor cortex, thus focusing on the cognitive cortical functions of the conscious human, in contrast to the subconscious realm of dreams [3]. The roots of dynamic psychotherapy and the later development of psychomotor therapy, that interpret body signs in dynamic categories, are founded on Freud's theories, whereas the later development of cognitive psychotherapy is in keeping with Duchenne's and Mensendieck's focus on the cognitive capacities of the conscious realms of the mind [4].

1.2. Relevant theories of motor learning

Mensendieck physiotherapy also contains many of the fundamental principles later developed into theories of motor learning [5–12]. The focus is on cognitive awareness of experience in own body, and the process of learning new motor patterns in contrast to old habits [13–19]. New motor patterns are developed through three phases:

(1) the *cognitive* phase, where the conscious awareness of the patient is directed towards sensory input from visual, tactile and proprioceptive stimuli regarding own body, and compared to ideal mentations with regard to the quality of new patterns sought to be obtained;
(2) the *associative* phase, where a consciousness gradually develops that integrates the new ideal patterns with new sensory input from the body; and
(3) the *automatized* phase, where the new and more efficient or functional motor patterns are utilized without conscious thought, and gradually integrated into behavioural patterns in the activities of daily life.

Thus, important basic elements are sensory awareness of own body, conscious cognition of new ideomotor patterns, and integrations of the new experience into everyday functions [20].

1.3. Development of psychomotor physiotherapy

Among the students of Freud were Wilhelm Reich, who added a new dimension to Freud's theories of the mental mechanisms of defense from threatening emotions and stressful experiences. Reich underscored that such unpleasant experiences left traces in the whole organism, and in particular led to a dysfunctional set of body expressions, that he called "Körperpanzer" (body armor) [21]. Reich visited Norway in the 1930s, and lasting impressions of his lectures and discussions led to the development of the Norwegian *psychomotor physiotherapy* tradition, developed by the psychiatrist Trygve Braatøy and the physiotherapist Adele Bülow-Hansen. This is a vibrant tradition of physical therapy, which has also developed a number of methods of body examinations in Norway and Scandinavia [22–24].

1.4. Cognitive psychotherapy and its relationship to the development of somatocognitive therapy

The authors were first acquainted with cognitive psychotherapy by Aron Beck's collaborator, Arthur Freeman [25], when he visited Modum Bad Psychiatric Hospital (Vikersund, Norway) in 1987. This form of therapy was introduced into the treatment of anxiety disorders, initially phobic anxiety. It occurred to us that the systematic approach to psychotherapy advocated by Freeman and Beck, had similarities with the Mensendieck tradition of physiotherapy as developed in the Oslo school [26]. A series of amendments were made to amalgamate the two therapy traditions. This was undertaken in collaboration with Ulrik Malt at the University of Oslo, Department of Psychosomatic Medicine, Rikshospitalet, in the 1990s. The aim of our work has been to develop instruments to

evaluate and treat patients with longstanding pain states and complex disorders, e.g., gynecologic pain, low back pain, chest pain, headache and widespread pain. Beck and his co-workers developed their theory and practice of cognitive psychotherapy further and applied it to a wide range of clinical states with diverse psychological symptom loads, among them depression and chronic pain [27].

1.5. The importance of the working alliance between the patient and the therapist

The primary goal of all therapy is to develop a good working alliance with the patient, without which therapy is futile [28]. This can be achieved in the first encounter with the patient if the therapist opens to empathic listening to the history of the patient. The treatment session then can continue by describing a possible explanation for the reported symptoms and a dialogue thus develops between the therapist and the patient about subjective body experiences (see below). The therapist teaches the patients about the mind/body relations and explains pain mechanism, in line with the principles of essential cognitive pain education that Lidbeck recommends [29–31].

Bordin in 1979 [28] defined the 3 main components that contribute to the working alliance construct as

(1) the therapist–patient agreement on goals of treatment,
(2) the therapist–patient agreement on interventions, and
(3) the affective bond [28].

It appears from previous research that the alliance is positively associated with treatment outcome and could be used as a predictor. In a recently published review of the therapist–patient relationship in physical rehabilitation, significantly positive associations were found between the working alliance and the patient's global perceived effect of treatment, change in pain, physical function, patient satisfaction with treatment, depression and general health status [32].

1.6. Additional important elements: functional anatomy, conscious awareness of own body, and mental rehearsal preceding movements

Mensendieck therapists are trained to assess motor function both in terms of global quality of movement and in the detailed function of every muscle group in the body [3,16–18,20]; the Mensendieck tradition is founded on principles of functional anatomy. However, Bess Mensendieck was also acutely aware of the fact that the generation of movements is a mental task, and that this task could be brought to conscious attention by mentally rehearsing the movement ahead of time, before the physical execution of the movement. The training programs start with the "teacher" and "pupil" imagining ("sketching") the movement to be practiced [3,20,33]. In physiologic terms, this preparation for movement involves several areas frontal to the primary motor cortex [10,12,34]. This form of ideomotor preparation of the movement proper, called "motor templates", have been shown to enhance motor learning [10,12,35]. The focusing on cognition preceding movement and on practicing new motor patterns in the activities of daily life, are in keeping with the principles of cognitive therapy as developed by Ellis, Beck, Freeman, and others [4,25,36].

An additional important aspect of Mensendieck therapy is to focus on the state of tension of a specific group of muscles or agonist. The patient's awareness is guided towards increase of tension in the muscle (maximal contraction), and the decrease of tension (maximal relaxation). This awareness of tension and relaxation should also be automatically practiced in movements of daily living, in keeping with the principles of "applied relaxation" [37].

Similar to patients in cognitive therapy, the patients treated by a Mensendieck therapist are always assigned graded tasks to be practiced several times each day, preferably while performing the activities of a normal life [20,33]. Thus, the new motor programs are sought to be automatized and internalized in the patient including the pattern of tension and relaxation of agonist and antagonist muscle groups. Further, the Mensendieck physiotherapy trainees are taught in a systematic way to be aware of own bodily experience, thus developing a high level of body awareness themselves, an awareness always sought to be transferred to the "pupil" or the "patient" [13–18,38].

The mental aspects of the effort it takes to change ingrained motor patterns are sometimes underestimated. In the Mensendieck tradition, this focus has been quite clear from the original works of Bess Mensendieck. It is the integration of mind and body that are characteristic of this tradition within physical therapy. Moreover, in our work within the field of psychosomatic medicine we have sought to increase awareness of this integrative approach. Thus, to underline the cognitive aspect of Mensendieck therapy we prefer the term "*somatocognitive therapy*" as label of the treatment approach that we review in this paper.

2. Somatocognitive therapy

Somatocognitive therapy is a hybrid between physiotherapy and psychotherapy. It is a short term body oriented therapy, concentrating on the situation here and now, and it does not focus on the possible historical roots of the symptoms.

The goal is to achieve new body awareness linked into the activities of daily living. As sessions evolve, the therapy may lead to the disclosure of repressed emotions. This is not the primary goal of the therapy, but emotions should be received by the empathic therapist. The therapist and the patient are seen as equally important partners in exploring the experiences of the patient. Similar to cognitive therapy, the session is three-phased:

(1) The patient recounts from her experience since the last session, reports on homework done, and possible new experiences or insights evolved through the new movements that have been practiced in the activities of daily living.
(2) The patient is taught new active movements in graded task assignments—again to be practiced several times each day, not as separate exercise sessions, but well integrated in the activities of the day, e.g., while walking to the bus, sitting in the office, lying down in bed, watching the television, while eating, performing house chores. These exercises may influence muscle relaxation, respiration, the flexibility of joints, muscles and ligaments, work loads on muscles and joints, extero- and proprioception, awareness of own body, and they may lead to reduced fear for movements (kinesophobia). It is of utmost importance that the training is started in a gentle manner, and that exercise is not exceeding the patient's capacities in any way. Abrupt change to vigorous physical activity may result in increased pain, possibly by mechanisms like temporal summation of pain [39]. Manual release of the tensed muscles may improve circulation of the muscle and lead to new tactile experiences. Hypothetically, release of endogenic substances like oxytocin foster bonding between therapist and patient [40]. The second part of the therapy session is always concluded with a brief session of applied relaxation.
(3) New assignments are given for homework, again underscoring that the most important part of therapy takes place during the intervals between therapy sessions.

The therapist constantly assures that the patient understands the significance of each step, and that the working alliance is upheld.

3. Somatocognitive therapy compared with standard gynaecological therapy in women with chronic pelvic pain (CPP)

CPP is pain in the lower abdomen and minor pelvis of women persisting for more than 6 months [41–43]. The prevalence of CPP is approximately 3–4% [44]. For further description of this diagnosis, see [45–47].

The main aims of our study were to describe the complex motor patterns (posture, movement and coordination, gait, sitting posture and respiration), and evaluate the effect of somatocognitive therapy. We developed an evaluation instrument specifically designed to assess these complex motor functions, the Standardized Mensendieck Test (SMT) [46].

3.1. Study design

40 women with CPP unexplained by pelvic pathology were randomized to (1) standard gynecological treatment (STGT) or (2) gynecological treatment plus Mensendieck somatocognitive therapy (STGT + MSCT). Visual analogue score (VAS 0–10) of pain, SMT scores and measure of psychological distress (General Health Questionnaire, GHQ-30) were obtained (a) at baseline (start of therapy), (b) at end of treatment (3 months after baseline), and (c) 1 year after baseline (9 months after end of treatment). For a detailed description of methods, see Haugstad [45–48].

3.2. Results after 3 months

Before treatment, STGT patients had VAS for pain 6.9 ± 0.3 (mean ± standard error) which was unchanged at three months (6.2 ± 0.5). The patients receiving Mensendieck somatocognitive therapy in addition to gynecological treatment (STGT + MSCT) had VAS for pain of 5.6 ± 0.4 at baseline, decreasing by 48% (2.9 ± 0.4) after three months [47]. Patients in the STGT group had no significant changes in the scores for any of the subtests for motor patterns (SMT). The STGT + MSCT group improved in all aspects of function (19% for posture, 25% for gait, 26% for movement, 28% for sitting posture, and a considerable 58% for respiratory movements [47]).

3.3. Effect of therapy on pain and motor functions at one year follow up

Nine months after end of treatment, patients in the group receiving standard gynecological treatment showed no significant change in pain [48]. By contrast, the patients receiving Mensendieck somatocognitive (STGT + MSCT) therapy demonstrated further improvement after end of therapy. The patients' subjective experience of pain was unchanged (6.1 ± 0.4) in the STGT group. In contrast VAS for pain in patients in the Mensendieck treatment group (STGT + MSCT) had improved further (2.2 ± 0.4; $p < 0.003$ from the 3 months values). Impressive 64% reduction in pain scores from baseline. The scores for motor patterns likewise were improved [48].

3.4. General health at one year follow-up

The scores for GHQ-30 showed statistically significant decreases in the sub-scale for coping (from 5.8 ± 0.67 to 4.1 ± 0.6; $p = 0.01$), and anxiety–insomnia–distress (from 9.7 ± 1.15 to 6.23 ± 1.03; $p < 0.001$) in the STGT + MSCT-group. No significant changes in the group receiving STGT only. The reduction in the subscale for depressive symptoms (from 3.4 to 2.6) was not statistically significant in the STGT + MSCT group ($p = 0.06$), whereas there was a non-significant increase in scores in the STGT group (from 2.1 to 2.9; $p = 0.17$ [48]).

4. Discussion

4.1. Pain reduction from somatocognitive therapy of chronic pelvic pain

The most important outcome is the substantial effect of somatocognitive therapy on the pain experienced by the patients with chronic pelvic pain. The level of experienced pain was reduced by almost 50%. Whereas two of the 20 patients for unknown reasons were non-responders, seven were almost pain-free after therapy. Our hypothesis of possible mechanisms for pain reduction may be any combinations of the following:

(1) Improvement of motor patterns of respiration, gait, posture, and movements, as well as reduced fear of movements. Such changes could imply a change of focus from pain experience towards positive body experiences and improved coping of daily activities and challenges.
(2) Improved lymphatic drainage and reduction of tissue edema of the hypogastric, inguinal, and pelvic regions of the patients as suggested by some authors [49,50].
(3) Changes in pain perception, due to altered central processing of pain stimuli in the brain and spinal cord. Several authors indicate that central sensitization of pain perception and defects in pain inhibition may play important roles in the development and maintenance of chronic pain states [29,51–54].

Psychological modulation of pain is of great importance [55]. Negative emotional states have been shown to enhance pain-evoked activity in limbic regions, such as the anterior cingulated and insular cortices [56]. The anticipation and expectation of pain activate pain-related areas [57]. Neuroimaging studies of the human cortical and subcortical pain response have identified a neuronal network referred to as the "pain matrix" [58]. Theories of mechanisms of effects of physical therapy and rehabilitation refer to these insights from the neurobiology of pain [59].

4.2. Possible reasons for the long-term positive effect of somatocognitive therapy

In addition to the short term outcome of therapy after the treatment period of three months, we have demonstrated that the motor patterns and pain experience of the patients continue to improve after end of therapy and are found to be significantly better at one year follow-up than immediately after three months of therapy. VAS pain scores were reduced by 48% at end of therapy and continued to improve to 35% of pain at baseline one year later.

Continued practice of the cognitive and motor elements of behaviours, intensely rehearsed in the activities of daily living during the treatment period, may have maintained the treatment effects. The "toolkits" of novel approaches that the patients acquire during treatment, are now owned by the patient. The success of these "tools" during active therapy motivated the patients to continue using these tools.

By changing the focus from pain experience towards coping of functions in activity of daily life and new motor patterns, the patient will be less fearful that movements elicit pain. This implies that new strategies have been learnt, both with respect to motor skills, and with respect to the reduction of anxiety levels. When people

understand *how and why* they are doing well, they can continue this behaviour to make themselves better. The patients will after a while in this kind of treatment be their own therapists, they have learnt how to cope with the challenges of daily living [3,16,38].

4.3. How is somatocognitive therapy different from traditional cognitive therapy for chronic pain

We underscore the close relationship between somatocognitive therapy and traditional cognitive psychotherapy as developed by Beck and co-workers since the 1960s. However, the two approaches are also different. Traditional cognitive therapy is psychotherapy [27]. As such, it only deals with the mental components of pain. Even when the psychotherapist promotes relaxation techniques, the patient only relates, in a passive way, to a restricted sensory input from the body. The therapist is not active in promoting alternative movement patterns that lead to alternative sensations from the body.

Somatocognitive therapy should be understood as a hybrid of physiotherapy and psychotherapy. A wide array of sensory input from and about the body is encouraged: e.g., visual, tactile, and proprioceptive. Even slight alterations in the postural tone or use of the extremities and shoulder and limb girdle may lead to profound alterations of the respiration pattern, the free movement of abdominal and pelvic muscle groups, the position of the head in relation to the spine, and the normal curvatures of the spinal column. The theories of motor learning are also distant from the theory of cognitive therapy.

On the other hand, somatocognitive therapy makes use of elements of cognitive therapy in that it incorporates the understanding of dysfunctional cognitive schemata that prepare the way for negative emotional load. This results in repressed body language. In the realm of psychiatry and psychotherapy, somatocognitive therapy also can be said to break certain taboo areas, in that physical contact between the therapist and the patient not only is encouraged, but is seen as an absolute prerequisite in therapy.

5. Conclusions

Somatocognitive therapy has been developed as a hybrid of Mensendieck physiotherapy and cognitive psychotherapy in an effort to meet the challenges of complex pain disorders. We documented in a randomized, controlled study of women with chronic pelvic pain that this intervention is very promising: reduction of pain and psychological distress, improved motor patterns, especially respiratory movements, gait, and ability to relax. Encouraged by these results we are now conducting several studies of patients with sexual pain disorders and other conditions with longstanding pain.

6. Subsequent developments and comments

The editorial comments to our last paper [48] in the American Journal of Obstetrics and Gynecology (AJOG): "...the somatocognitive approach should be applied to patients with chronic urogenital and musculoskeletal pain... Gynecology departments should develop treatment programs for patients with chronic pelvic pain that incorporate a somatocognitive approach to motor analysis and therapy... when no such program is available at the patient's treatment facility, she should be referred to one elsewhere"[48]. In our opinion, we need more research before such wide-ranging recommendations can be made. Preliminary results from a pilot study where the current approach is applied in women with vulvodynia are promising. Montenegro et al. [60] are interested in different aspects of our approach, ranging from interest in the posture's effect on the tilt, position and motion of the pelvis, to the effect of a full abdominal respiration on the hemodynamics and lymphatic drainage of the pelvis minor, and the overall focus on showing empathy and establishing a good working alliance with the patient. The male counterpart to CPP, chronic prostatitis, may also be accessible to therapy with similar techniques [61].

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