Posture, movement patterns, and body awareness in women with chronic pelvic pain

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Received 9 September 2005; received in revised form 4 May 2006; accepted 9 May 2006

Abstract

Objective: Chronic pelvic pain (CPP) is a common cause of infirmity but is still poorly understood. We studied the clinical characteristics, including body awareness, of 60 women with this diagnosis compared to those of healthy controls in an effort to understand its pathophysiology and to develop a more efficient treatment protocol.

Methods: After prior gynecologic and psychometric evaluation, the women were examined with the Standardized Mensendieck Test to evaluate posture and movement patterns. Pain history and pain score were obtained, and patterns of muscular density, elasticity, and tenderness were determined by palpation. The body awareness of patients was assessed through clinical evaluation.

Results: Seventy percent of the patients had a history of trauma or infection of the genitourinary region. The average pain score (±S.D.) on a scale from 0 to 10 was 6.01 ± 1.60. Nearly all patients had a dissociative pattern, with a lack of contact and control of large body regions. All scores for posture and movement patterns were significantly worse in patients than in healthy women.

Conclusion: A specific pattern of pain, posture, movement, muscle pathology, and reduced awareness of one’s own body was found in women with CPP. These findings may increase our understanding of, and may point toward new treatment strategies for, this disease.

Keywords: Chronic pelvic pain; Standardized Mensendieck Test (SMT); Body awareness; Somatoform pain disorder; Visual analogue score of pain

Introduction

Chronic pelvic pain (CPP) is a syndrome that is defined by a long duration of pain in the pelvis. It may originate from several organ systems or diseases and may have multiple contributing factors that usually do not occur in isolation. The exact prevalence of CPP in the female population is not known, but it has been suggested as 2–3%. A higher prevalence is found in health care settings than in the general population [1]. Consultations recorded in UK general practice show that the prevalence of CPP is similar to those of migraine, back pain, and asthma [2,3]. Up to 40% of women who consult gynecologists [1,4,5] complain of chronic pain in the lower abdomen, with fertile women more often reporting this type of pain than menopausal women. It has been estimated that women with CPP use approximately three times more medications of any type than do healthy women. The number of gynecologic operations performed, including hysterectomy, is four times higher in this group than in other women. The resulting costs for health service are considerable, amounting to US$880 million per year in the United States alone [1,6].

Despite the magnitude of the clinical problem, our understanding of this disorder is inadequate, and there are
Nijenhuis [17] defines the latter as syndrome, along with signs of somatoform dissociation. Women exposed to longstanding sexual abuse often describe a pattern typical of CPP women. It should be noted that similar findings may be present in patients with CPP and thus point at possible targets for intervention. However, this has not been studied to any extent.

The aim of the present study is to address these shortcomings in our knowledge by studying the clinical characteristics of posture, movement, gait, sitting posture, and respiration in women with CPP. Additional focus will be on the examination of muscular tension, elasticity, and tenderness of the abdominal, pelvic, and inguinal regions. The following questions will be addressed: (a) How do patients experience their pain and how do they describe the development of pain state and body experiences? (b) Is there any movement pattern that can be detected as typical in CPP patients compared to that in healthy women? (c) Is there any apparent pattern of muscular tension, elasticity, and tenderness that is typical of patients with CPP?

Method

Assessment of patients

We included 60 women who were referred to the outpatient Department of Gynecology of The National Hospital (Oslo, Norway), a tertiary care university hospital. The mean age was 31 years, and the mean duration of pain was 6 years. We also included 15 healthy female matched controls with a mean age of 29 years. Assessment included a full medical record, clinical examination, gynecological examination, and palpation of pelvic muscles. History included a thorough record of pain development. They were also given a schematic drawing of the human body and then asked to indicate on the schema on which part of the body their pain was localized. If comorbidity disorder was suspected, the patient was duly referred to other specialists. The patients were also evaluated by a psychologist to exclude psychiatric comorbidity (see Haugstad et al. [18] for details of the exclusion criteria). Subsequently, the patients were examined by a Mensendieck physical therapist with a full standard clinical examination. Pain record was obtained by a series of standard questions included in the clinical interview, with regard to the following: when the pain started and life events simultaneous to the first experience of pain, character of pain, development of pain character and intensity, and how pain could be eased or provoked. The patient was asked to describe the present situation with regards to pain, pain-related behaviors, and mental state. Physical examination included Lasègue’s test to exclude lumbar nerve root affection, and pelvic examination to exclude pelvic instability. Body awareness and body control were assessed by noting (a) the patient’s own statement regarding one’s own body (e.g., “I don’t touch that area,” “My body is only pain and no pleasure,” etc.) and (b) the patient’s ability to isolate and differentiate the use of individual muscles, tension of the muscles, and movement of isolated joints and body parts. The examination further included palpation of areas indicated as painful (always starting from the periphery and working towards the most painful areas) along with close monitoring of the patient’s pain reaction and whether emotional or vegetative responses were involved. Clinical data were recorded in a research journal and subsequently tabulated. The patients were also examined by the Standardized Mensendieck Test (SMT) [19]. The examination was videorecorded.

The SMT

The manualized test has been described earlier [19] in a pilot study and was found to be a reliable assessment tool in the hands of experienced Mensendieck physical therapists. Mensendieck was careful in tracking movements down to the simplest forms of daily life activities, such as standing, bending over, sitting down, rising from a seat, walking, ascending stairs, raising and lowering arms, and so on [20]. We thus developed a standardized test to analyze posture, movement, gait, sitting posture, and respiration—altogether five domains, each with three to seven subtests (see Table 1). In this standardized test, we instructed the patients and healthy controls to lift their arms, stand on one leg, swing both arms in parallel while bending slightly in the knees, and likewise swing the arms in contrary motion as they were being videotaped [19]. Respiration was observed in the supine position. An important part of this observation was assessing respiratory response to pelvic lift and arm lift—a
response that occurs spontaneously, often not noted by the test subject herself. All subjects were asked to perform these simple exercises. The therapist demonstrated each subtest once, while giving a simple verbal description. The subjects were asked to immediately imitate these movements.

Performance scores were given for each subtest of posture, gait, movement, sitting posture, and respiration on a scale from 0 to 7 (0 = greatest deviation from the optimal function, 7 = optimal function), according to a standardized protocol. ICC1.1, which assesses agreement among three physiotherapy raters, has been found to be in the range between 0.83 and 0.97.

Examination of muscles

In addition to the SMT, we also examined specific muscle groups for elasticity and density. Palpation was performed with the tips of the fingers (noting the consistency of the cutis and the subcutis down to the muscle), feeling the bulk of the muscle and working transversely across the bulk. Each muscle is examined from its less painful part towards the more painful part. Muscles of both sides of the body were examined, with the least painful side always examined first, for comparison of both the patient and the examiner. The muscle was said to have normal, high, or very high density and elastic stiffness, scored as 0 = normal, 1 = high, and 2 = very high. This judgement was made on the basis of clinical experience, and reliability was assured by interrater comparison. The patient’s subjective experience of pain was also marked with 1 = painful and 2 = very painful. The muscles that were systematically examined were femoral adductor muscles, iliopsoas muscles, abdominal muscles, muscles in the gluteal region, and hip outward rotators.

Visual analogue scale (VAS) of pain

The patients were instructed by means of a written statement about the purpose and procedure for pain self-evaluation (VAS). They were asked to assess, on each day during the first week of the study, their subjective experience of pain on a scale from 0 to 10 and to mark the score on a straight line (0 to the left and 10 to the right), with 0 = no pain and 10 = maximum pain experience. The average of the daily scores for this week was taken as baseline value.

Statistical methods

Average and standard deviation (S.D.) were calculated for the SMT scores of all 60 patients. Statistical significance was evaluated by independent-samples t test, comparing 15 patients with 15 matched controls. Average and S.D. were calculated for VAS and for the muscular findings of all 60 patients.

Table 1

<table>
<thead>
<tr>
<th>Domains</th>
<th>Mean (S.D.)</th>
<th>Patients (n=60)</th>
<th>Control (n=15)</th>
<th>P (n=15)</th>
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<tbody>
<tr>
<td>Posture</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global</td>
<td>4.36 (1.08)</td>
<td>5.33 (0.39)</td>
<td>.011</td>
<td></td>
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<tr>
<td>Ankle</td>
<td>4.11 (1.01)</td>
<td>5.56 (0.66)</td>
<td>.003</td>
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</tr>
<tr>
<td>Knee</td>
<td>4.10 (1.08)</td>
<td>5.47 (0.85)</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Pelvis</td>
<td>4.17 (0.85)</td>
<td>5.22 (0.97)</td>
<td>.004</td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td>4.20 (1.01)</td>
<td>5.15 (0.85)</td>
<td>.006</td>
<td></td>
</tr>
<tr>
<td>Shoulder</td>
<td>3.94 (1.08)</td>
<td>5.16 (0.89)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Neck</td>
<td>3.98 (0.93)</td>
<td>4.72 (1.32)</td>
<td>.008</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>4.13 (0.85)</td>
<td>5.23 (0.35)</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Movement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global</td>
<td>3.77 (1.01)</td>
<td>5.81 (0.85)</td>
<td>.004</td>
<td></td>
</tr>
<tr>
<td>Frontal</td>
<td>3.50 (1.08)</td>
<td>5.60 (1.24)</td>
<td>.008</td>
<td></td>
</tr>
<tr>
<td>Vertical arm lift</td>
<td>3.51 (1.16)</td>
<td>5.85 (1.32)</td>
<td>.006</td>
<td></td>
</tr>
<tr>
<td>Hip flexion</td>
<td>3.72 (1.16)</td>
<td>6.01 (0.70)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Sagittal arm swing</td>
<td>3.88 (1.24)</td>
<td>5.77 (0.97)</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Diagonal arm swing</td>
<td>3.59 (1.39)</td>
<td>5.90 (0.81)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Gait</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global</td>
<td>3.66 (0.93)</td>
<td>5.80 (0.39)</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Foot roll</td>
<td>3.37 (1.01)</td>
<td>5.60 (0.70)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Propulsion</td>
<td>3.50 (1.01)</td>
<td>5.68 (0.74)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Rotation</td>
<td>3.30 (1.01)</td>
<td>5.36 (0.70)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>3.32 (1.01)</td>
<td>5.60 (0.35)</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Sitting posture</td>
<td>3.84 (1.16)</td>
<td>5.52 (0.97)</td>
<td>.005</td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td>3.81 (1.24)</td>
<td>5.70 (0.97)</td>
<td>.005</td>
<td></td>
</tr>
<tr>
<td>Pelvis</td>
<td>3.77 (1.08)</td>
<td>5.70 (0.97)</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Back</td>
<td>3.74 (1.08)</td>
<td>5.60 (0.81)</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>3.79 (1.08)</td>
<td>5.64 (0.39)</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>Respiration</td>
<td>3.32 (1.01)</td>
<td>5.50 (0.74)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Pelvis</td>
<td>3.22 (1.01)</td>
<td>5.55 (0.70)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Arm lift</td>
<td>3.23 (1.01)</td>
<td>5.55 (0.77)</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>3.25 (1.01)</td>
<td>5.63 (0.39)</td>
<td>&lt;.001</td>
<td></td>
</tr>
</tbody>
</table>

We developed the SMT to analyze posture, movement, gait, sitting posture, and respiration. Each element of the test (in all 24 subscores) was assigned a score from 0 to 7 (0 = least functional movement, 7 = optimal performance). Average scores (with S.D.) were calculated. Independent-samples t test was applied to calculate the probability values for 15 controls versus 15 patients.

Fig. 1. VAS score of patients with CPP. The VAS scores (indicating the intensity of pain on a scale from 0 to 10) of the 60 patients included in the study (scores not obtained from two patients) are presented in the histogram. A VAS score of 7 shows the highest frequency.
Informed consent

The patients were oriented about the project by a gynecologist, and written information was given by the psychologist. After examination by a physiotherapist, they had to sign an informed consent form approved by the hospital committee for clinical ethics, which ensured that the study complied with the ethical standards of the Declaration of Helsinki [22]. They were informed that they could end participation in the study at any time.

Results

Clinical characteristics

The average score for subjective pain for all 60 patients was 6.01 (S.D.=1.60, range=3–8), on a scale from 0 to 10 (Fig. 1). Seventy-five percent of the patients had moderate or severe pain during or after intercourse. This pain and aching in the lower abdomen would last for many days. Fifty percent of the patients described this as aching in one inguinal region or in both inguinal regions and also in the subumbilical region. The same percentage felt that the lower abdomen was swollen and had difficulty wearing jeans. They felt more comfortable using wide pants with elastic rubber lining.

Twenty-five percent reported that pain started after an infection in the bladder or in the kidney region, and 25% reported that the pain developed after an abortion or after difficult labor. About 15–20% had a recount of sexual abuse. A typical statement from these patients was a feeling of the abdominal region being a taboo area, which they would avoid touching and even moving. They had experiences of their whole body being painful, with no pleasurable sensations left. They also reported lack of contact and lack of control over whole regions of their bodies.

Muscular density, elasticity, and tenderness in 60 women with CPP

<table>
<thead>
<tr>
<th>Muscles</th>
<th>Density [mean (S.D.)]</th>
<th>Elasticity [mean (S.D.)]</th>
<th>Subjective pain [mean (S.D.)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costal rim</td>
<td>0.50 (0.77)</td>
<td>0.50 (0.77)</td>
<td>0.53 (0.85)</td>
</tr>
<tr>
<td>Straight abdominal, right</td>
<td>1.52 (0.77)</td>
<td>1.53 (0.77)</td>
<td>1.53 (0.77)</td>
</tr>
<tr>
<td>Straight abdominal, left</td>
<td>1.26 (0.85)</td>
<td>1.26 (0.85)</td>
<td>1.28 (0.85)</td>
</tr>
<tr>
<td>Internal oblique abdominal, right</td>
<td>0.55 (0.70)</td>
<td>0.59 (0.70)</td>
<td>0.57 (0.70)</td>
</tr>
<tr>
<td>Internal oblique abdominal, left</td>
<td>0.47 (0.62)</td>
<td>0.47 (0.62)</td>
<td>0.48 (0.62)</td>
</tr>
<tr>
<td>External oblique abdominal, right</td>
<td>0.53 (0.70)</td>
<td>0.55 (0.70)</td>
<td>0.57 (0.70)</td>
</tr>
<tr>
<td>External oblique abdominal, left</td>
<td>0.45 (0.62)</td>
<td>0.47 (0.62)</td>
<td>0.48 (0.70)</td>
</tr>
<tr>
<td>Transverse abdominal</td>
<td>0.38 (0.62)</td>
<td>0.40 (0.70)</td>
<td>0.40 (0.70)</td>
</tr>
<tr>
<td>Gluteus maximus, right</td>
<td>1.57 (0.70)</td>
<td>1.59 (0.70)</td>
<td>1.60 (0.70)</td>
</tr>
<tr>
<td>Gluteus maximus, left</td>
<td>1.31 (0.93)</td>
<td>1.29 (0.93)</td>
<td>1.31 (0.93)</td>
</tr>
<tr>
<td>Femoral adductor, right</td>
<td>1.41 (0.85)</td>
<td>1.38 (0.85)</td>
<td>1.38 (0.85)</td>
</tr>
<tr>
<td>Femoral adductor, left</td>
<td>1.16 (0.93)</td>
<td>1.12 (0.93)</td>
<td>1.12 (0.93)</td>
</tr>
<tr>
<td>Lumbar quadratus, right</td>
<td>0.10 (0.39)</td>
<td>0.10 (0.39)</td>
<td>0.10 (0.39)</td>
</tr>
<tr>
<td>Lumbar quadratus, left</td>
<td>0.14 (0.46)</td>
<td>0.14 (0.46)</td>
<td>0.14 (0.46)</td>
</tr>
<tr>
<td>Piriformis/obturator, right</td>
<td>0.74 (0.85)</td>
<td>0.74 (0.85)</td>
<td>0.74 (0.85)</td>
</tr>
<tr>
<td>Piriformis/obturator, left</td>
<td>0.57 (0.77)</td>
<td>0.57 (0.77)</td>
<td>0.57 (0.77)</td>
</tr>
</tbody>
</table>

Muscular density, elasticity, and tenderness were evaluated by palpation in 60 women with CPP. This table gives the average values (S.D.) of scores from 0 to 2 (0=normal findings, 1=high, and 2=very high density, elasticity, and tenderness of the muscle).

Posture and movement patterns assessed with the SMT

All subscores found in the patients were significantly worse ($P<.01$) than those of healthy controls. The largest difference in scores between the two groups was found for gait, movement, and respiration. Subscores were 54% worse for pelvic rotation in the gait domain of scores and 52% worse for pelvic lift in the respiration domain and for diagonal arm swing in the movement domain, respectively, compared with those of healthy controls. The least difference between patients and controls was found in subscores for posture (Table 1).

Posture

In the standing posture, the area of support was minimal, with the feet being posed close together, the pelvic area pushed forward, and the shoulders and upper parts of the back pulled backwards, generating the impression that they recline behind their line of gravity. This posture of stance was reflected in an 18% reduction in scores for the line of gravity in patients compared to that in healthy women. We also frequently observed an epigastric incision right below the costal line in standing position.

Regarding sitting posture, the typical observation was patients sitting on one tuber ischium (often with minimal support on the chair), with the legs flexed and crossed and with no lumbar lordosis (but rather a kyphosis in the lumbar region). The largest differences between healthy women and patients were in the position of the pelvis and in the support subtest (the difference being 44% for both) (Table 1).

Movement

The greatest deviation from the normal pattern was found for tests that posed a demand on balance and
coordination. In the test for hip flexion, the patients had
great difficulty trying to stand on one leg for 10 s, scoring
38% below that of healthy controls. Furthermore, their
ability to coordinate the movements of both arms and both
legs in the sagittal (33%) and diagonal arm swing tests
(39%) were well below that of healthy controls (see
Table 1). When testing their ability to lift extended arms to
shoulder height and let them fall down, the ability to give
in to gravity was found to be reduced for patients
compared to controls (40% for the vertical arm lift test).
When examining gait, we observed a careful gait with
short steps and almost no foot propulsion, and a markedly
reduced hip extension in the propulsion phase. Accord-
ingly, gluteal muscles were poorly developed. The rotation
of the pelvis was barely visible. Propulsion differed by
42% and rotation differed by 39% from those of healthy
women.

Respiration

The typical finding is high costal respiration with almost
no movement in the thorax or in the abdominal area. In the
subtests “pelvic lift” and “arm lift” in the evaluation of
respiration, the scores differed by 52% from those of healthy
women (see Table 1).

Muscle palpation

The highest density and the highest degree of elastic
stiffness were found in the following muscles (average
values): iliopsoas, 1.57 ± 0.70 (right side) in density and
1.59 ± 0.70 in elastic stiffness. Iliopsoas was also most
painful 1.60 ± 0.70 (right side). Almost the same score was
found in straight abdominal muscles, with 1.52 ± 0.77 in
density, 1.53 ± 0.70 in elastic stiffness, and 1.53 ± 0.70 (right
side) in tenderness. Femoral adductors also had high scores:
1.41 ± 0.77 (density) and 1.38 ± 0.85 (elastic stiffness and
tenderness) on the right side (see Table 2).

Discussion

To our best knowledge, this is the first comprehensive
study to examine the complex body characteristics of
patients with CPP in a systematic and reliable way. Clinical
examination revealed a characteristic pattern of standing,
sitting, and walking, as well as lack of coordination and
irregular high costal respiration. This pattern has not been
described by previous authors, and we consider these
findings to be of significant importance for understanding
the pathogenesis of this clinical syndrome and to be a
putative guide towards new treatment modalities.

Many of the described features (altered patterns of
movements and no touching of hypersensitive and swollen
lower abdominal area) may be ascribed to what we would
like to call a “pelvic-pain-protecting pattern.” The typical
pattern described above (see Results) in our opinion
correlates to the well-known “guarded behavior” in patients
with low back pain, who also present poorer postural
stability [23] associated with some compensation of
respiratory disturbance to posture [24]. Lamoth et al. [25]
described the gait pattern in patients with low back pain,
especially the reduced rotation of the lower spine, and
Kvale et al. [12] described patients with long-lasting
musculoskeletal pain, who were found to have less ability
to relax and to give in to gravity. All of these character-
istics are typical of our population of women with CPP. It
may seem somewhat surprising that the coordination and
the relaxation of the upper extremities are affected in these
women. However, considering the increased psychological
and muscular tension described as “guarded behavior,” this
may, after all, be quite logical. The muscles of the
shoulder girdle and the muscles of the neck are typically
involved in the high-thoracic-respiration pattern associated
with high levels of tension and anxiety that utilize the
“muscles of accessory respiration.” The marked deviation
from normal respiratory response to the lifting of arms
and pelvis in the supine position is also quite notable, as
this response often occurs unnoted by the test subject and
may be seen as reflecting the tension of the patients at
lower levels of consciousness.

In observing the posture of the patients, it was noted that
the area of support was minimal, with the feet posed closely
together, although it is well known that body posture is less
stable when the support base area is reduced [26] and that
the feet are spontaneously spread in patients with equili-
brum troubles (e.g., cerebellum syndromes). Hence, the
posture of CPP patients must be inherently unstable, and the
“pelvic-pain-protecting pattern” said to overcome usual
equilibrium strategies.

In terms of understanding the development of this
pathology, one may hypothesize a “vicious circle”: Initial
pains and aches result in a protective movement pattern,
which, secondarily, in order to reduce exposure to pain and
by virtue of the reduced movement of the diaphragm,
pelvic floor, rotation of the lower spine, straightening of
the normal lumbar lordosis, and others, leads to reduced
blood circulation and decreased lymphatic drainage of
tissue fluids.

A majority of the patients related a history of sexual
problems. They had pain during and after intercourse to a
certain degree such that they consistently avoided engag-
ing in sexual activity. The women not only had pain and
high elastic density in the muscles of the pelvic floor
when examined by the gynecologist but also in several
other muscle groups that are in close relation to this
region of the body [18]. Thus, the muscles in the hypo-
gastrum, the iliopsoas muscles, and the muscles of the
upper thigh (i.e., the femoral adductors) were all found to
have high elastic stiffness, high density, and high degree
tenderness on palpation.
Mattson et al. [27] reported altered patterns of posture, movement, and respiration in a study of five women with CPP. She also reported that pelvic examinations elicited strong emotional reactions. None of her probands reported sexual abuse, but four of five had had traumatic reproductive experiences (involuntary infertility, late miscarriage, ambivalence towards pregnancy, and acute cesarean section). She suggested that pain reactions represented “bodily reflections of repressed painful experiences other than sexual abuse” [27].

In our study, we found that 15–20% of women reported that they have been exposed to sexual abuse. Sexual abuse during childhood can lead to severe psychosomatic dysfunctions both in children and in adults [17,28,29]. Possible long-term results are depression, anxiety, emotional and cognitive problems, personal dysfunction, eating and sleeping disorders, alcohol or drug abuse, relationship problems, social maladaptation, and somatization. Sexual abuse has a profound impact on women’s health. Taking a history of sexual abuse seems particularly warranted when the patient presents with CPP or symptoms of a vague and diffuse nature [29]. The severe nature of late psychological symptoms in sexually abused women may be the reason for the relatively low representation of this form of abuse in our material, since many women with such experience may have been excluded from our study by our strict criteria of inclusion.

FitzGerald and Kotarinos [9] also described tender and short muscles in the pelvic floor in CPP patients. They found that CPP patients experience some difficulty in performing isolated pelvic floor contraction on request. The pelvic floor contracted weakly because the muscles are short and painful. These findings correspond to our findings. The authors suggested that the patients were completely unable to localize the muscles in the pelvic floor and they, therefore, used accessory muscles when they were requested to contract the pelvic floor (i.e., the muscles in their buttocks and thigh adductors). The myofascial abnormalities that they described in this study of 49 patients were localized in the same area described in this paper [9]. Their patients also complained of extremely sharp pain when the therapist exerted minimal pressure. They were unable to sense the relaxation of the muscle, and the return of the muscle to a relaxed state could be slow, further in line with our observations. These findings may suggest that CPP patients have decreased body sensations, decreased body awareness, and a pattern of somatic dissociation [17].

Swelling and edema of the lower abdominal region and the inguinal region in pelvic pain patients have also been noted by several authors [10,11]. Although, in some cases, this might be caused by chronic inflammation in the genitourinary region or by anatomical abnormalities in venous return, another explanation is at hand in the face of our observations of an abnormal motor pattern and increased muscular stiffness and tenderness. Abnormal respiratory pattern and pelvic protection pattern may themselves lead to hampered venous drainage, as observed in the dilation of pelvic veins [10]. Thus, the vascular phenomenon could be viewed as secondary to primary muscular dysfunction, leading to increased tissue fluids and local tissue hypoxemia and lactacidemia [11].

Diagnosis of CPP in the International Classification of Diseases, Tenth Revision (ICD-10)

We have demonstrated that women with CPP display a stereotypical pattern of motor aberrations, pain distribution, and, in several ways, lack of normal body sensations and control. Thus, the symptoms represent both somatoform and dissociative qualities. In parallel with the concept of alexithymia (lack of ability to feel or express emotions), we would like to support the introduction of the concept of alexismia in this field [30], as these women, in many ways, lack a normal quality of sensations (exteroceptive and proprioceptive) and the ability to express themselves in a functionally normal body language.

We excluded women with serious psychiatric comorbidity, as well as women with apparent somatic disease, in order to fulfill the diagnostic criteria for ICD-10 F45.4 (chronic somatoform pain disorder). Nonetheless, a stereotypical somatic pattern is expressed in the women thus selected. This could be viewed as an argument against classifying CPP under F45.4, since this diagnosis excludes defined somatic findings. In our view, our results, on the contrary, should stimulate a discussion of how we understand disorders that are viewed as somatic expressions of mental stress or dysfunction. In this respect, we find the arguments of Nijenhuis [17] interesting, in that he compares the understanding of mental and somatic dissociations in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, and ICD-10, respectively, and makes an argument in favor of the concept of somatic dissociation. If myogenic pain is a central component in CPP syndrome, one could argue that this syndrome should be classified together with other syndromes with pain of myogenic origin, such as tension headache and low back pain of muscular origin. Thus, it seems that further discussions regarding the classification of and the relationship between mental and somatic components of psychosomatic disorders are warranted [31].

Clinical implications

In this study, we demonstrated nonfunctional motor and respiration patterns in patients with CPP. The patients also had decreased body sensations, decreased body awareness, and a pattern of somatic dissociation. These findings may lead to new options for treatment and education for the patients in question [32]. Recently, we reported promising results from a randomized controlled intervention study, using Mensendieck somatocognitive therapy [18]. This
treatment approach builds on the strengths of Mensendieck physiotherapy, both in relation to enhancement of body awareness and the development of new cognitive strategies necessary to alter motor behaviors in activities of daily living. The results further demonstrate the necessity of a thorough clinical examination, including both psychometric evaluation and a detailed description of static and dynamic muscle functions not only of the pelvis minor [32] but also of muscles of adjacent regions, as well as observations of patterns of respiration, gait, and posture.

The limitations of the present study are obvious in that the numbers of patients and normal controls are relatively small. Nonetheless, contemporary criteria for statistical power have been taken into consideration in designing both the development of the SMT in the treatment study [18] and the description of clinical patterns in these patients in the present study. In addition, the rigorous exclusion criteria utilized have excluded from our study a large group of patients with CPP and concomitant psychiatric comorbidity. Thus, the selected group of patients may not be representative of the clinical pattern encountered in these patients, neither in general medical practice nor in patients referred to gynecologists.

Future studies

In future studies, patients with higher psychiatric symptom loads should be included. This goes for patients with symptoms of anxiety and depression who show signs of dissociation and for patients with personality disorders. A separate study of women with CPP who have been exposed to sexual abuse may also be warranted [32]. Furthermore, other groups of patients with psychosomatic and somatoform disorders should be examined in the same rigorous way for deviating motor patterns (i.e., patients with chest pains, low back pain, and headache) [33].

Regarding treatment modalities, further studies (following the patients for an extended period after completed treatment and evaluating both motor patterns and subjective pain experience) are necessary. We would also like to be able to judge the effect of psychotherapy given alone or in combination with Mensendieck somatocognitive therapy in patients with psychosomatic disorders.

Acknowledgments

We would like to thank the “Norske kvinners sanitets-forening” and the Oslo University College for generous support of this study.

References

[21] Gallagher EJ, Liebman M, Bijur PE. Prospective validation of clinical patterns in these patients in the present study. In addition, the rigorous exclusion criteria excluded from our study a large group of patients with CPP and concomitant psychiatric comorbidity. Thus, the selected group of patients may not be representative of the clinical pattern encountered in these patients, neither in general medical practice nor in patients referred to gynecologists.

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References


