Pain Pattern in Pregnancy and "Catching" of the Leg in Pregnant Women With Posterior Pelvic Pain

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Study Design. A cross-sectional study of symptoms and signs in pregnant women.

Objectives. To describe the clinical appearance of back pain in pregnancy and the relation between pain distribution and symptoms in women with posterior pelvic pain, in order to shed light on etiologic factors.

Summary of Background Data. Back pain is common in the general population. During pregnancy, it is even more common, and back pain is experienced by about 50% of pregnant women. In the pregnant woman, differentiation between common low back pain and posterior pelvic pain is believed to be essential because these symptoms should be treated in different ways.

Methods. The women were interviewed with a questionnaire. Those with back symptoms completed a pain drawing and were examined by an orthopedic surgeon. Based on the symptoms and findings, the women were divided into three groups: thoracic pain, lumbar pain, and posterior pelvic pain.

Results. Of 338 pregnant women, 51% had back pain at the time of examination. The pain was more widespread compared with common low back pain. Seventy-one percent of the 171 patients examined by the orthopedic surgeon had a positive posterior pelvic pain test. These women more often had pain in the gluteal and posterior thigh regions. A "catching" feeling of the leg was described when walking by 44 of 122 these women, whereas only 1 of 49 women without a posterior pelvic pain test had such symptoms.

Conclusions. The higher prevalence of back pain in pregnancy may be due to several factors. In women with posterior pelvic pain, there is a specific symptom—a catching of the leg when walking. The most probable explanation for the catching is that local nociception disturbs muscular function in women with posterior pelvic pain because changes in the sacroiliac joint range of motion, which is very small, cannot cause this symptom. [Key words: disturbed muscle function, low back pain, posterior pelvic pain, pregnancy] **Spine 1997; 22:1880–1884**

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Back pain is common in the general population. During pregnancy it is even more common, and back pain is experienced by about 50% of pregnant women.[2,10,15] In a study by Östgaard et al,[15] 22% of the women already had back problems before pregnancy, and another 27% experienced back pain during the pregnancy. They also pointed out that age, multiparity, and psychosocial work factors had an impact on the risk of back pain during pregnancy.[15] Obviously, the etiology of back pain is multifactorial. However, knowledge of the pathogenesis, physiology, and management of this widespread problem is far from complete. Diagnostic differentiation between common low back pain and posterior pelvic pain in the pregnant woman is believed to be essential because the treatment should be different.[17]

The objective of the current study was to describe the clinical appearance of back pain in pregnancy in general and in women with posterior pelvic pain in particular.

Patients and Methods

About two thirds of all pregnant women in the city of Malmö attend the same maternity care unit. They may be considered to be a representative sample of ordinary pregnant women in the city. During a 2-week period, all women in various stages of their pregnancies, between the 12th and 40th weeks, were asked to participate. The women were interviewed by questionnaire about age, present pregnancy, previous pregnancies, and previous and present back pain. Those who answered "yes" to the question "Do you at present have back pain?" completed a pain drawing and an additional questionnaire on the impact of their pain on various activities. Specifically, we asked if they experienced a "catching" of the leg when walking, that is, difficulties in moving one or both legs forward. The average pain level and the severity of the pain attacks were estimated according to a 10-cm visual analog scale. All women with pain were examined by an orthopedic surgeon. The configuration and the mobility of the back were noted.

A posterior pelvic pain test (PPPT) was performed as described by Östgaard et al.[17] The test was positive when the supine patient felt pain that she could recognize when her vertically positioned femur was gently pressed posteriorly by the examiner.

Based on the examination findings and symptoms, the women were subdivided into three groups:

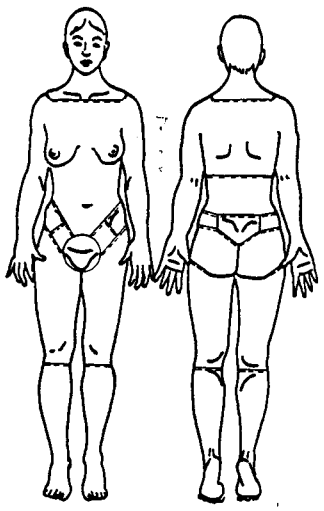

Figure 1. To interpret the pain drawings, these areas were defined.

1. Thoracic pain: when pain could be provoked by movement in the thoracic spine
2. Lumbar pain: when the pain was located in the lumbar area and could be provoked by movement in the lumbar spine
3. Posterior pelvic pain: when pain could be provoked by the PPPT

Some women belonged to two groups.

To make interpretation of the pain drawings easier, they were divided into smaller areas, as shown in Figure 1. The areas were chosen based on our experience of pain distribution in pregnant women, and thus were more detailed in the pelvic area.

■ Results

Of 347 consecutive women, 338 agreed to participate in the study. Of these women, 171 had back pain (51%) at the time of the examination. Another 17 women who had pain on and off during their pregnancy were also included.

One hundred seventy-one women were examined by the orthopedic surgeon; 17 declined to participate because of lack of time. The configuration of the back was normal in 92%. Six patients had minor scoliosis, six had an increased lordosis, and two had a decreased lordosis. The finger-to-floor distance was 12 ± 14 cm. Pain could be provoked by forward bending in 70%, by side bending in 15%, by rotation in 8%, and by extension in 34%. The PPPT was positive bilaterally in 34% and unilaterally in 37%, and was negative in 29% (Table 1).

Of 168 women (3 missing), 45 experienced pain when walking. They described a feeling of "catching." Of these, all except one had a positive PPPT, usually on the same side on which they experienced the catching of the leg (Table 1).

Table 1. Catching of the Leg (n = 45) Occurs Practically Only in Pregnant Women With a Posterior Pelvic Pain Test (PPPT)

	All	Right Side	Left Side	Both Sides	No Catching
Postive right side	29	10	1	1	17
Positive left side	33	1	11	2	19
Positive both sides	57	9	3	6	39
Negative	49	0	0	1	48
All	168	20	15	10	123

$\chi^2_{df} = 21.6$; $P < 0.0001$

A pain drawing was completed by 185 women. The distribution of pain is presented in Figure 2. The pain modalities associated with the various areas are presented in Table 2. The pain was in many cases widespread; on average, 3.7 ± 2.1 of the 15 areas were affected. The most intense pain was usually located in the low back and gluteal areas. The pain in the back was most frequently a dull ache, in the gluteal area, stabbing, and in the thoracic back, often burning. Women with a unilateral positive PPPT had gluteal and posterior thigh pain more often than other pregnant women (Figure 3), and the sensation was often of a stabbing type (Figure 4). Women with a bilateral positive PPPT more often had lumbar, lumbosacral, symphyseal, or groin pain than those testing negative. Among these women, the pain was often a dull ache. Patients with a negative PPPT rarely had pain in the gluteal area or in the symphysis, but sometimes in the groin and the iliac crest. The pain score according to the visual analog scale was in general

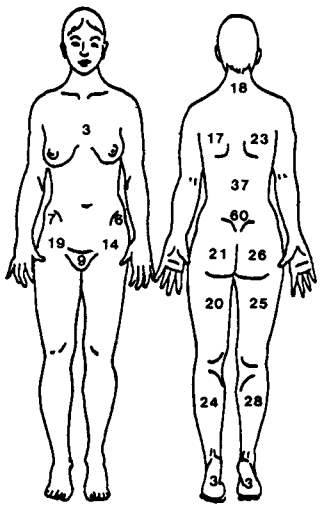

Figure 2. Pain distribution during pregnancy (percentages).

Table 2. Percentage of Women Describing Particular Pain Modalities in Specific Areas

	Thoracic Back	Lumbar Back	Lumbosacral Back	Gluteal Region	Groin Region	Upper Leg	Lower Leg
Dull aching	22	23	40	9	8	8	4
Burning	10	3	3	1	1	2	2
Numbness	—	—	—	1	—	1	1
Stabbing	5	9	19	11	8	8	2
Pins and needles	5	1	1	2	1	3	2
Muscular cramp	0.5	5	4	2	3	4	19

2.3 ± 2.0 cm, and during episodes of increased pain, 5.8 ± 1.9 cm. There was no significant difference in the degree of pain among the three groups of patients.

Discussion

In the pregnant woman, pain in the back and legs is quite common and could be considered as more or less normal. According to Figure 2, it is obvious that the pain in pregnancy is widespread and not, as in the general population, restricted to the lumbar region.[14] This widespread pain indicates that systemic factors may be of importance.

An alteration of the connective tissue with increased mobility of the finger joints can be observed in premipregnant women as early as the 12th week.[16] It is possible that hormones affect not only the finger joints, but decrease the stiffness of the intervertebral discs, thereby causing pain. In fact, a correlation has been found between the plasma level of relaxin and symptoms,[7,8] but this has been questioned by others.[12]

Because the prevalence of back pain is already high in the 12th week, weight gain cannot be the only explanation, even if there is a successive increase in the prevalence as well as intensity of the pain during pregnancy.[16]

In the theories of intercellular communication in the central nervous system, two kinds of electrochemical transmission have been proposed for the experience of pain. One, wiring transmission, uses neuronal chains (synaptic contacts), whereas the second, volume transmission, uses extracellular fluid to act as the physiologic substrate (e.g., neurohormones).[1] During late pregnancy and the parturient period, estrogen and progesterone activate a spinal κ opiate receptor analgesic mechanism.[4] However, an opposite effect on the perception of pain is also possible. Thus, the widespread pain and the increase of pain during pregnancy can be due to the effects of hormones on neuronal transmission. A teleologic explanation postulates that pain makes the woman more careful during her pregnancy.

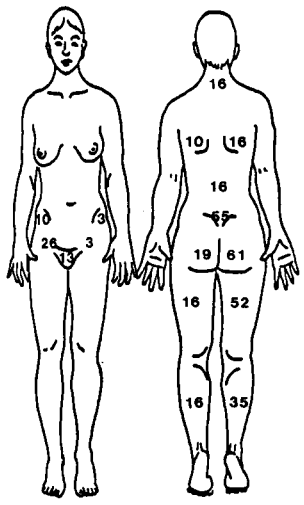

Figure 3. Pain distribution in women with a unilateral, right-sided positive posterior pelvic pain test (percentages).

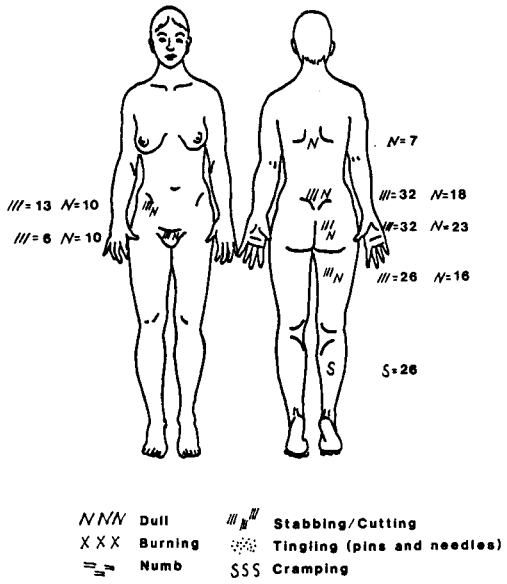

Figure 4. Typical pain pattern in women with a unilateral positive posterior pelvic pain test. Forty-two percent of these women experience a "catching" of the leg during the swing phase of their gait.

In this study, we have used the PPPT to create a subgroup of pregnant women. According to Östgaard et al, these patients do not benefit from back-strengthening exercises.[17] Thus, at least in one sense they differ from pregnant women with common back pain. The fact that pain could be provoked by movement of the sacroiliac joints does not necessarily mean that this tenderness is due to unusual mobility or inflammation in the joints; it is possible that the increased sensitivity also could be due to referred pain from discs, facet joints, or muscles. For instance, Kjellgren[6] found that injections of hypertonic saline into muscles, ligaments, and periosteum cause referred pain, and that the site of maximum tenderness is not necessarily the site of injection.[5]

Among the 122 pregnant women with posterior pelvic pain, 44 reported a "catching" of the leg, that is, they had difficulty in moving the leg forward when walking, usually on the same side as the pelvic pain (Table 1).

Because the sacroiliac joints move only a few degrees, catching in the joint cannot be the cause of this phenomenon.[13] It is more likely that the pain disturbs the function of the muscles. Experimentally, it has been shown that injection of hypertonic saline in the facet joints of the L4–L5 and L5–S1 vertebrae causes myoelectric activity in the hamstring muscles with a decreased straight leg raising test.[11] This probably results from the phylogenetic relations in the spinal medulla between the sclerotome, myotome, and dermatome.[5,6]

The sacroiliac joints have a wide innervation (L4–S1), and thus increased tenderness of the sacroiliac joint can be caused by nociceptive afferents from anatomic structures that have their innervation from these roots. Because the pain patterns of women with posterior pelvic pain differ from those of other pregnant women—for example, they often had stabbing pain—it may be that pain from sclerotomes related to the sacroiliac joint inhibits the function of muscles flexing the hip. Because this disturbance is often unilateral (Table 1), it is not likely to be due to a general disturbance of the nervous system.

Because some patients have symptoms long after delivery, when there is no increased range of motion,[13] dysfunction of the sacroiliac joint is a less probable explanation for these gait disturbances than remaining facilitation of the pain reflexes. A similarly increased sensibility has been observed in other joints; for example, in a study of cervical zygapophyseal joints, pain persisted in spite of a healed anterior interbody fusion.[3] Thus, there was joint pain because of an intrinsic mechanism that did not depend on motion.

Our data support the view that several factors contribute to the increase of back pain during pregnancy. The central mechanisms should not be forgotten, because otherwise there is a risk that treatment will be directed to the site of the peripheral symptoms only. Differentiated physical therapy is claimed to reduce back and posterior pain in pregnancy.[17] Another approach also should be tested, whereby the women are informed about the symptoms and are encouraged to continue ordinary activities within the limits permitted by the pain. This approach has at least proved to be better than bed rest or exercise in the treatment of patients with acute low back pain.[9]

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