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Pelvic girdle pain: examination, treatment, and the development and implementation of the European guidelines

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Abstract

Pelvic girdle pain (PGP) is experienced between the posterior iliac crest and the gluteal fold, particularly in the vicinity of the sacroiliac joints. The pain may radiate in the posterior thigh, and can also occur in conjunction with or separately in the symphysis. The pain or functional disturbances that are related to this condition must be reproducible by specific clinical tests for a definitive diagnosis to be made. Despite the fact that pregnancy-related PGP is a common ailment, it is still poorly described and understood. Studies have shown that it is a relatively common problem in many countries. It has been estimated that approximately 20–25% of all pregnant women suffer from PGP that is sufficiently serious to require medical help. The majority of women with the condition recover spontaneously soon after delivery; however, 7% report serious problems resulting from persistent PGP that last for many years. The aetiology and pathogenesis of pregnancy-related PGP is unclear. In diagnosing this condition, a thorough history and physical examination should be carried out in order to differentiate between low back pain and PGP, assess the underlying pain disorder and disability, and formulate an individualized management plan. The European guidelines for the diagnosis and treatment PGP recommend individualized exercises in pregnancy, an adequate supply of information about the condition, and reassurance for patients as part of a multifactorial treatment focusing on specific exercises for motor control and stability postpartum. In order to improve the quality of treatment, physiotherapists must have evidence-based skills, listen attentively and individualize treatment. Outcome measures are needed to adequately evaluate interventions. The Pelvic Girdle Questionnaire, a condition-specific measure, has recently been developed for pregnant and non-pregnant women with PGP.

Keywords: diagnostics, guidelines, pelvic girdle pain, physiotherapy, treatment.

Introduction

The European guidelines for the diagnosis and treatment of pelvic girdle pain (PGP) (Vleeming *et al.* 2008) were developed within the framework of COST B13, a European Commission programme for the development of European guidelines for the management of back pain. The

objective of this COST B13 project was to increase consistency in the management of non-specific low back pain (LBP) across Europe (Vleeming *et al.* 2008). To ensure that COST B13 adopted an evidence-based approach, recommendations were based on Cochrane and other systematic reviews, and on existing evidence-based national guidelines. However, few systematic reviews and randomized controlled trials (RCTs) of PGP were available, and no national

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guideline on PGP existed; consequently, it was difficult to develop an evidence-based guideline.

The authors searched for all relevant studies published in the international literature and used the existing evidence to develop the European guidelines. The guideline working group consisted of experts in the field of PGP. None of the members believed that they had any conflicts of interest. The literature search covered the period from the beginning of 1927 to the end of 2004, but four studies published in 2005 and 2006 were also included. A grading system was used to denote the strength of the evidence. The studies were considered to be of high methodological quality if the following criteria were met:

- an adequate method of randomization;
- concealment of treatment allocation;
- drop-out rate described and acceptable;
- intention-to-treat analysis;
- blinding of the observer or outcome assessor; and
- no co-interventions.

The primary objective of the exercise was to provide a set of recommendations that could support future national and international guidelines on PGP. Ultimately, this should lead to the prevention of long-term complications, reduction of pain and improvement of disability.

The clinical questions covered by these guidelines were:

- What is the most optimal diagnostic process for patients with PGP?
- What is the most effective treatment for reducing pain and improving disability in patients with PGP?

Pelvic girdle pain generally arises in relation to pregnancy, trauma, arthritis and/or osteoarthritis. The guidelines proposed a definition for pelvic musculoskeletal pain under the title PGP that excluded gynaecological and/or urological disorders, and promoted a consistent use of terminology (Vleeming *et al.* 2008, p. 797):

“Pelvic girdle pain generally arises in relation to pregnancy, trauma, arthritis and osteoarthritis. Pain is experienced between the posterior iliac crest and the gluteal fold, particularly in the vicinity of the [sacroiliac joints (SIJs)]. The pain may radiate in the posterior thigh and can also occur in conjunction with/or separately in the symphysis.

“The endurance capacity for standing, walking, and sitting is diminished.

“The diagnosis of PGP can be reached after exclusion of lumbar causes. The pain or functional disturbances in relation to PGP must be reproducible by specific clinical tests.”

Readers of the guidelines may not necessarily agree with all of the recommendations that are included. However, they are challenged to develop their own national guidance on PGP, and it is hoped that the European guidelines will be a useful basis for future criteria (Vleeming *et al.* 2008). Furthermore, these guidelines identify gaps in the scientific evidence on PGP, and hence, future research is encouraged. When additional scientific evidence becomes available in the near future, the European guidelines should be updated.

So, where are we in the field of PGP?

Current status of research in the field of pelvic girdle pain

Prevalence

Despite the fact that pregnancy-related PGP is a common ailment, it is still poorly described and understood. Studies have shown that PGP is a relatively common problem in many countries, irrespective of their socio-economic status. Although the vast majority of studies have been carried out in Scandinavia, this condition has also been reported in Africa, America, Asia, Australia and Europe (Vleeming *et al.* 2008). The world-wide prevalence of PGP and back pain in pregnancy has been reported to be approximately 50%, even though a large variation was found between studies (Wu *et al.* 2004). This variation may be a result of the diagnostic criteria employed by the various trials. Most probably, approximately 20–25% of all pregnant women suffer from PGP that is sufficiently serious to require medical help (Wu *et al.* 2004; Vleeming *et al.* 2008). The majority of women with the condition recover spontaneously soon after delivery; however, 7% report serious problems resulting from persistent PGP that last for many years (Wu *et al.* 2004).

Pathogenesis

The aetiology and pathogenesis of pregnancy-related PGP are unclear. The most common hypothesis about the development of this condition is that it is caused by a combination of both hormonal and biomechanical factors. Studies of the relationship between serum relaxin levels and PGP are few and conflicting, and

therefore, no definite conclusion can be drawn regarding a possible association (Vleeming *et al.* 2008). Despite a large overlap in the range of symphyseal motion between patients with pregnancy-related lumbopelvic pain and healthy control subjects, a recent review reported a larger motion of the symphysis during pregnancy and puerperium in patients with PGP than in those without (Mens *et al.* 2009). This increased motion in the pelvic joints may diminish the efficiency of load transfer and increase the shear forces across the joints. It has been suggested that increased shear forces are responsible for pain in women with this condition (Vleeming *et al.* 2008). The pelvis serves to transfer load from the trunk to the legs. For the load to be effectively transferred and for the shear forces to be minimized across the joints, the pelvis needs to be optimally stabilized. Stability is obtained by ridges and grooves in the articular surfaces of the SIJs (form closure) and additional compression forces (force closure), which are generated by the muscles, fascia and ligaments. In contrast to generalized laxity, asymmetric laxity of the SIJs, as measured with Doppler imaging, has been shown to correlate with moderate to severe levels of symptoms in subjects with postpartum PGP (Damen *et al.* 2001).

A theoretical model based on anatomical and biomechanical studies introduced the concept of the self-locking mechanism of the SIJs, and the principles of form and force closure (Snijders *et al.* 1997). Studies have shown indications of the failure of the self-locking mechanism and load transfer through the pelvis (Hungerford *et al.* 2003, 2004). Pelvic girdle pain disorders have been associated with an alteration in the strategy for lumbopelvic stabilization, including excessive as well as insufficient motor activation of the lumbopelvic and surrounding musculature (O'Sullivan & Beales 2007b). Aberrant motor control patterns may be a possible mechanism for ongoing pain and disability in patients with persistent PGP (Beales *et al.* 2009), and positive changes in motor control have been found to be associated with improvements in pain and disability (Stuge *et al.* 2004a; O'Sullivan & Beales 2007a).

It has been hypothesized that pelvic floor muscle (PFM) dysfunction may cause a deficit in the force closure mechanism, resulting in impaired load transfer and pain in the lumbopelvic area (Pool-Goudzwaard *et al.* 2004, 2005). Besides controlling continence and the position of the pelvic organs, the PFMs are also believed

to provide stability to the lumbopelvic region (Neumann & Gill 2002; Richardson *et al.* 2004; Sapsford 2004). The PFMs surround the pelvic openings, and during voluntary contractions, these muscles increase urethral closure pressure, lift the pelvic organs and prevent descent during rises in intra-abdominal pressure (Ashton-Miller & Delancey 2007), as well as constricting the levator hiatus (Dietz *et al.* 2005). However, few studies have examined PFM function in patients with PGP, and there is uncertainty regarding the association between the function of the PFMs and PGP, and whether strengthening exercises for the PFMs should be recommended.

A recent matched case-control study investigated voluntary PFM function in women with and without clinically diagnosed PGP by palpation, vaginal pressure transducer (manometry) and three-dimensional ultrasound (Stuge *et al.* 2012). However, the results showed no significant differences in voluntary PFM function in terms of strength, endurance and vaginal resting pressure. The levator hiatus area, together with body mass index, was significantly associated with PGP. Women with PGP had a statistically significantly smaller levator hiatus and a tendency for higher vaginal resting pressure compared with control subjects. Since higher vaginal resting pressure might indicate increased PFM activity, Stuge *et al.* (2012) gave no specific evidence in favour of prescribing strengthening exercises for the PFMs of women with PGP. However, a limitation of the study was that only voluntary contractions and not the automatic responses of the PFMs to a functional activity were examined.

Diagnostic aspects

A thorough history and physical examination should be carried out in order to make a diagnosis of PGP. The aims are to differentiate between LBP and PGP, assess the underlying pain disorder and disability, and formulate an individualized management plan. Useful methods of differentiation include the site of the pain, its character and severity, provoking factors, resultant disability, and clinical tests. The characteristic symptoms and cardinal pain of PGP are located in the sacrum, under the posterior superior iliac spine, the gluteal area, the posterior thigh and/or the pubic symphysis. Other regions frequently indicated as painful are the groin and the coccyx. One of the characteristics Swedish gynaecologist P. G. Cederschiöld described in 1839 was the sometimes extreme

difficulty of moving the lower limbs (cited in Genell 1948). Difficulty in walking has been confirmed by other studies and proposed as a diagnostic sign for PGP (Sturesson *et al.* 1997). A classification system designed to categorize non-specific lumbopelvic pain as either LBP or PGP was recently presented by Gutke *et al.* (2009).

Because of the low reliability and validity of most clinical tests, a diagnosis should not be made on the basis of only one assessment. A multiple-test score is a more accurate method. The posterior pelvic pain provocation (P4) test, the long dorsal sacroiliac ligament test, the Patrick's or Flexion, Abduction, External Rotation and Extension test, and the distraction test are recommended for the diagnosis of pain in the SIJ region (Laslett *et al.* 2005; Vleeming *et al.* 2008). For pubic symphysis pain, direct palpation of the symphysis and the modified Trendelenburg test are proposed. The active straight leg raise (ASLR) test assesses the ability to transfer load between the trunk and the legs, and aberrant motor control patterns have been observed in subjects with PGP during this assessment (Beales *et al.* 2009). The most well-established tests for PGP are the P4 and the ASLR tests, which are reported to have a high sensitivity and specificity (Vleeming *et al.* 2008). The P4 test was recently found to be negative in patients with a well-defined lumbar diagnosis (Gutke *et al.* 2009). The ASLR test is also useful in assessing disease severity and responsiveness (Mens *et al.* 2002), and in predicting its severity in women with PGP postpartum (Vøllestad & Stuge 2009).

Treatment

Pregnancy and prevention. Suggestions regarding the management of women's pain and disability are varied and include different kinds of treatment regimes. An updated systematic review of interventions in pregnancy (Pennick & Young 2007) included eight RCTs that examined the effects of adding various pregnancy-specific exercises, physiotherapy, acupuncture and pillows to usual care. Those who participated in an exercise programme in addition to their usual prenatal care, regardless of the treatment programme, reported less-intense pain than those who received usual care alone, although the effect size was small. However, one cannot rule out a possible placebo effect in studies of usual prenatal care (no treatment) versus active participation in exercise programmes. Furthermore, the methodological quality of the studies of

pregnant women tended to be rather poor and had a potential for bias in the results (Pennick & Young 2007). A recent thorough literature search identified three additional RCTs (Depledge *et al.* 2005; Kalus *et al.* 2008; Licciardone *et al.* 2010); however, no significant positive effect of treatment was shown in these trials. One study examining the prevention of LBP or PGP showed that group training had a minor but statistically significant effect on pain and disability (Mørkved *et al.* 2007). The use of acupuncture for PGP is increasing even though the evidence of a positive effect is scarce. A recent high-quality study showed that acupuncture had no significant effect on pain or on the amount of sick leave taken compared with sham acupuncture (Elden *et al.* 2008). There is also insufficient scientific evidence to conclude that wearing maternity support belts reduces pregnancy-related LBP or PGP (Ho *et al.* 2009). The European guidelines for PGP recommend individualized exercises in pregnancy (Vleeming *et al.* 2008).

Postpartum. Four RCTs were found in the previously mentioned recent literature search examining postpartum LBP and/or PGP (Mens *et al.* 2000; Stuge *et al.* 2004a; Bastiaenen *et al.* 2008; Gutke *et al.* 2010). These studies showed high methodological quality. However, only the study by Stuge *et al.* (2004a) demonstrated statistically and clinically significant positive and long-lasting effects (Stuge *et al.* 2004a, b). The treatment programme studied focused on exercises for motor control and stability of the pelvic girdle. The main focus of the exercises was to improve force closure with co-ordination of the local and overall muscle system, with control of a neutral position of the lumbopelvis being addressed in particular in order to develop strength and endurance to manage the physical demands facing each individual. Additionally, the essential points addressed were SIJ restrictions, posture, breathing and cognitive behavioural perspectives. The cognitive aspects were an important part of the intervention in addition to the exercises. The European guidelines for PGP postpartum recommend giving adequate information and reassuring patients as part of a multifactorial treatment focusing on specific exercises for motor control and stability (Vleeming *et al.* 2008).

Exercises

Exercise programmes for patients with lumbopelvic pain have traditionally focused on

To what extent do you find it problematic to carry out the activities listed below because of pelvic girdle pain? For each activity tick the box that best describes how you are today.

How problematic is it for you because of your pelvic girdle pain to:	Not at all (0)	To a small extent (1)	To some extent (2)	To a large extent (3)
1. Dress yourself				
2. Stand for less than 10 minutes				
3. Stand for more than 60 minutes				
4. Bend down				
5. Sit for less than 10 minutes				
6. Sit for more than 60 minutes				
7. Walk for less than 10 minutes				
8. Walk for more than 60 minutes				
9. Climb stairs				
10. Do housework				
11. Carry light objects				
12. Carry heavy objects				
13. Get up/sit down				
14. Push a shopping cart				
15. Run				
16. Carry out sporting activities*				
17. Lie down				
18. Roll over in bed				
19. Have a normal sex life*				
20. Push something with one foot				

☐
☐

* If not applicable, mark box to the right.

How much pain do you experience:	None (0)	Some (1)	Moderate (2)	Considerable (3)
21. In the morning				
22. In the evening				

To what extent because of pelvic girdle pain:	Not at all (0)	To a small extent (1)	To some extent (2)	To a large extent (3)
23. Has your leg/have your legs given way?				
24. Do you do things more slowly?				
25. Is your sleep interrupted?				

Figure 1. The English version of the Pelvic Girdle Questionnaire. Reprinted from Stuge *et al.* (2011, p. 564) with permission. Scoring procedure: the scores were summarized and recalculated to percentage scores from 0 (no problem at all) to 100 (to a large extent).

strength and general fitness. However, research has suggested that a key impairment of the muscle system is related to motor control rather than strength alone (Richardson *et al.* 2004). The above authors reasoned that such impairments need to be addressed specifically before, or at least in conjunction with, more general exercise programmes. Supervision of exercises is critically important in improving the quality of exercise

performance because there are indications that there is a strong correlation between the quality of exercise performance and a decrease in pain. Supervision and regular follow-up enable the therapist to adjust a programme according to the patient's progress and might contribute to the maintenance of exercise benefits. In addition, positive experiences achieved during exercising may also possibly contribute through reduced

fear of pain and anxiety about physical activity. Therefore, possible fear-avoidance behaviour can be circumvented.

The heterogeneity of problems experienced by patients with PGP highlights the need for an individual problem-solving approach. It is unlikely that all women with this condition would profit from the same treatment, and a “one size fits all” approach to the prescription of therapeutic exercise is not rationally based. Furthermore, it has been pointed out that patients need to understand not just what to do, but why they should do it in order to facilitate empowerment and commitment to change. Consequently, before recommending any treatment, each individual’s underlying mechanisms for pain have to be investigated. Even though most women recover from PGP in pregnancy, the evidence shows that those with several positive clinical tests and pain from all three pelvic joints have a markedly worse prognosis (Albert *et al.* 2001), and therefore, special attention should be paid to this group of women.

Patient experiences

There is increasing recognition within the physiotherapy profession that research into patients’ views of the service should be undertaken (Hills & Kitchen 2007). It has been shown that PGP affects women’s ability to function and that healthcare professionals need to listen to them and provide support (Crichton & Wellock 2008). It has also been shown that pregnant women’s expectations of care for PGP are not met and that their knowledge about how to manage the condition is lacking (Wellock & Crichton 2007). A better understanding of patients’ experiences could make a contribution to improving the quality of their treatment and provide further information about recovery. Thus, a qualitative study to elucidate patients’ positive and negative experiences of a treatment programme for postpartum PGP was recently performed (Stuge & Bergland 2011). This concluded that dialogue and individualized guidance were perceived positively by women coping with their daily lives. By being active agents in managing their PGP and therapy, these patients learned to set themselves proximal goals. Perceived hope and self-efficacy seemed to be essential for developing a capacity for self-management and an enhanced ability to benefit from appropriate learning experiences. To improve the quality of the treatment they provide, physiotherapists must have evidence-

based skills, listen attentively and individualize treatment.

Pelvic Girdle Questionnaire

Outcome measures are needed to adequately evaluate interventions. Since there seem to be good reasons for classifying LBP and PGP as two different conditions, outcome measures validated for LBP are not necessarily the most sensitive for PGP. Hence, there is a need for suitable outcome measures in research and in clinical practice that are reliable and valid for patients with PGP. However, no appropriate measures have been specifically developed and validated for this condition (Boissonnault 2009). Therefore, a condition-specific measure, the Pelvic Girdle Questionnaire (PGQ) (Fig. 1), was developed for pregnant and non-pregnant women (Stuge *et al.* 2011). This consists of 20 activity items and five symptom items on a four-point response scale. The PGQ is reliable and valid for both pregnant and postpartum women with PGP. It is also simple to administer, and practical for use in both research and clinical practice. The PGQ has also been shown to discriminate significantly between both pregnant and non-pregnant patients, as well as between different pain locations (Grotle *et al.* 2012).

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Figure 2. Dr Britt Stuge.

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