Chapter 8

General discussion and conclusion

In the early stages of the work presented in this thesis, it became obvious that discussing almost any aspect of pelvic pain induced more controversy than had been expected. Some important events of the past 10 years are briefly outlined below.

In 1991 the Dutch "Association for patients with pelvic complaints in relation to symphysiolysis" was founded. This association contacted the "Research Group Musculo-skeletal System" of the Erasmus University Rotterdam which had been studying anatomical, biomechanical and radiological aspects of the sacro-iliac joint since many years.[9,15] In the same year a questionnaire was sent to all patients who con tacted the Association in the first 9 months after its foundation (Chapter 2). In 1994 a randomized clinical trial was started to investigate the effect of exercises in peripartum pelvic pain (PPPP; Chapter 3).

From 1992 to 1996 the Dutch media dedicated much time and attention to PPPP, ranging from patients' letters to major news items. The main issues centered on the high impact of the problem and the ignorance of the medical profession. Tragic highest point was without any doubt a television talk show on prime time, December 5th 1995.[3] Only those patients were invited to speak in the program with an uneventful course. In preparation for that program a search was made in order to include patients in wheelchairs and on crutches; especially patients with failed surgery were welcome. Also in 1995, a Dutch gynecologist warned in her dissertation: "Pelvic instability is a freak of fashion and not a disease." [7] A storm of reactions followed.

During 1996 the media reports on PPPP became more optimistic. In that year the 'Spine & Joint Centre the Netherlands' was founded; this rehabilitation center offered the unique combination of research on and treatment of PPPP. Moreover, a television program showed how severely handicapped patients with PPPP could be successfully treated by surgical fusion of the pelvic joints.[13] The media announcements from that time consisted of a large wave of sensational successes concerning a wide range of therapeutic measures. The climax of this new trend was probably the story of a wheelchair-confined patient with PPPP who was instantaneously cured after consulting a 'faith healer' on the street.[4]

Whereas in the first five years of the 1990s the media focused on the severity of PPPP, during the last 5 years of the 20th century the many promising therapies were discussed. News about the severity of the disease was, in many cases, exaggerated; this

resulted in emotional judgments of medical professionals and anxiety among patients. The news about new therapies was, in many cases, over-enthusiastic; this led to disappointment among patients. Against this psychosocial background it was difficult to perform biotechnical research: when in 1993 a randomized clinical trial on exercises in PPPP was prepared, less than 10% of the patients with PPPP who consulted the study group was previously treated with exercises so it was decided to include only patients in the trial who were not treated with exercises. Three years later, long before the trial was published and before any evidence was found that exercises were useful, only 3 patients during 6 months could be included because more than 90% of the patients who contacted the study group were already treated with exercises.

Chapter 2 presents the results of an inquiry among 394 patients with PPPP. It is concluded that PPPP may seriously interfere with many activities of daily living. Patients with PPPP with onset during pregnancy were compared with those with onset within three weeks after delivery; no differences were found with respect to the kind of complaints, the severity of the disease and the prognosis. It was therefore recommended to pool both groups of patients in studies on chronic PPPP.

The randomized clinical trial, presented in Chapter 3, showed that after 8 weeks no important differences existed between the three treatment groups investigated. It was concluded that in treating patients with persistent pelvic pain, training of the diagonal trunk muscle systems, without individual coaching, has no additional value. It seems that the exacerbation of symptoms due to loading of the spinal and pelvic joints overrules the potential benefit gained by enlarged muscle force. Especially the exercises to reinforce the gluteus maximus seem to overload the ligaments, partly by direct traction on the sacrotuberous, sacrospinal and long dorsal ligament, and secondarily by initiation of movements in the joints of the pelvic ring.

Three tests were developed to qualify and quantify PPPP: the Active Straight Leg Raise test (ASLR test), weakness of hip abduction, and weakness of hip adduction. Intra-tester reliability, inter-tester reliability, sensitivity, specificity and responsiveness of all three tests proved to be acceptable to good (Chapters 4-7). In previous studies it was hypothesized that symptoms in PPPP are caused by overloading of the ligaments of the pelvic ring and/or lumbopelvic junction during activities in which loads have to be transferred between legs and trunk.[10] From a biomechanical point of view, PPPP is characterized by impairment of this function. The three tests could be seen as a check for this function.

Evidence is found for the hypothesis that joint laxity and degeneration of the joints in the pelvic ring play a role in PPPP. This is based on the following observations:

1. Mobility of the pelvic joints in puerperal women with pelvic pain is greater than in puerperal women without pelvic pain.[1]
2. Mobility of the pelvic joints increases between the third and seventh month of pregnancy.[2,5] The incidence of PPPP during pregnancy parallels the mean increase of pelvic joint mobility (Chapter 2).

3. The ASLR test is a valid and reliable instrument to qualify and quantify PPPP. X-rays taken during the ASLR test show an anterior rotation of the hip bone at the tested side; the anterior rotation is larger at the side where the ASLR test is positive than at the side where the test is negative (Chapter 5).
4. A pelvic belt decreases mobility of the pelvic joints.[16] Tightening of the pelvic belt in patients with PPPP decreases the score on the ASLR test (Chapter 5).
5. In severe cases of PPPP, fusion of the three joints of the pelvic ring generally leads to physical improvement.[13,14]
6. Pathologic anatomic analysis of the symphyseal joints of patients operated for PPPP show a more pronounced degeneration than the symphyseal joints of age-matched female controls (AB van Vugt, personal communication).

Besides the role of joint laxity and degeneration of the pelvic joints it is suggested that lumbopelvic pain is caused by disturbed proprioception and decreased muscle function due to pain, fatigue and loss of coordination.[6,8,11,12] Especially patients with joint laxity may become trapped in a vicious circle which includes pain and fatigue, decreased proprioception, decreased muscle function, decreased muscular stability, and decreased load transfer between spine and legs. It seems that the ASLR test measures, in particular, the decreased load transfer function whereas the weakness of abduction and adduction of the hips and the posterior pelvic pain provocation test (PPPP test) indicate, in particular, the overloading of the ligaments of the pelvic ring and/or lumbopelvic junction.

Initial rationale for the present study was the hypothesis that lack of stability of the pelvis contributes to the incidence of non-specific low back pain. The findings in our studies support this idea both from a clinical and a biomechanical viewpoint.

Research questions suggested for future investigations.
1. The most important issue for the future is to establish whether patients with low back pain in combination with a positive score on one or more of the tests which characterize PPPP have a different prognosis compared with patients with low back pain and a negative score on those tests. Our studies indicate that this may indeed be the case with regard to the use of a pelvic belt, exercises to improve the use of the transverse abdominal muscle, and surgical fusion of the pelvic joints.
2. How does PPPP develop during pregnancy? Which signs and symptoms (e.g. positive ASLR and/or PPPP test, abduction or adduction weakness) precede pelvic pain? How to predict the natural course of PPPP?
3. How to predict the results of rehabilitation in PPPP?
4. How to predict the result of fusion of the three joints of the pelvic ring?
5. Is it possible to demonstrate appropriate use of the transverse abdominal muscle by means of echography? Is appropriate use of the transverse abdominal muscle, assessed echographycally, correlated with clinical progression of patients with PPPP?

6. In which percentage of patients with chronic lumbopelvic pain (in general practice, in a neurologic outpatient population and in a pain clinic population) is the ASLR test or the PPPP test positive; and in how many is hip adduction and/or abduction weak?
7. Which movements can be assessed by means of roentgen stereo-photogrammetric analysis in the pelvic joints and the lumbar spine when performing the ASLR test (with and without a pelvic belt) and/or the PPPP test, or when the strength of hip abduction or hip adduction is measured.

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