

A prospective randomized study comparing acupuncture with physiotherapy for low-back and pelvic pain in pregnancy

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Background. The aim of this study was to describe the effects of acupuncture in the treatment of low-back and pelvic pain during pregnancy and compare it with physiotherapy.

Methods. Sixty pregnant women were allotted to acupuncture or physiotherapy. The women estimated the severity of their pain using a visual analog scale (VAS) from 0 to 10 and disability in performing twelve common daily activities using a disability-rating index (DRI) from 0 to 10.

Results. In the acupuncture group all 30 women completed the study (two exclusions), in the physiotherapy group only 18. Before treatment the two study groups were rather similar with respect to pain and disability. After treatment the mean morning VAS had declined from 3.4 to 0.9 ($p < 0.01$) in the acupuncture group and from 3.7 to 2.3 (NS) in the physiotherapy group. The corresponding evening values had declined from 7.4 to 1.7 ($p < 0.01$) and 6.6 to 4.5 ($p < 0.01$), respectively. The mean VAS values were lower after acupuncture than after physiotherapy both in the morning ($p = 0.02$) and in the evening ($p < 0.01$). After treatment also the mean DRI values had decreased significantly in the acupuncture group for 11 of 12 activities and the values were significantly lower for all activities than in the physiotherapy group where no significant changes had taken place. Overall satisfaction was good in both groups. There were no serious adverse events in any of the patients.

Conclusions. Acupuncture relieved pain and diminished disability in low-back pain during pregnancy better than physiotherapy.

Key words: acupuncture; low back pain; pelvic pain; physiotherapy; pregnancy

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Low-back and pelvic pain during pregnancy (LBP) is a common syndrome of uncertain etiology characterized by pain and disability originating from the low-back and the pelvis during pregnancy and puerperium. In some studies from the 1980's and 1990's about half of the interviewed pregnant women reported LBP at some time during their pregnancies (1, 2), and an incidence as high as 78% has been reported (3). Women who smoked, had a

strenuous job or had a history of low-back problems, were at higher risk of getting LBP (1).

LBP often presents in the third trimester but may appear already in the first. Typically the pain is located in the lower back, the sacro-iliac joints and the symphysis pubis. Relaxin, inducing relaxation of the pelvic and lumbar ligaments, is thought to play an etiologic rôle, together with increasing maternal weight and altered posture due to the enlarging uterus (2, 3). This may result in instability and misalignment, leading to increased load on, and possibly micro-trauma to, the affected joints and ligaments. Physical activity in-

Abbreviations:

LBP: low-back pain; VAS: visual analog scale; DRI: Disability Rating Index.

volving the lower back and pelvis (e.g. walking, bending, lifting and carrying) may aggravate the pain and hinder the patient from doing her work or other daily activities. LBP may also cause poor sleep. The pain and disability range from mild to severe and tend to worsen during pregnancy (4). Symptoms are often milder in the morning and worse in the evening.

LBP is the leading cause of sick leave during pregnancy in Sweden (2). In a report to the Swedish Government in 1995, the National Social Insurance Board (Riksförsäkringsverket) stated that of the women who gave birth in 1992 in Sweden, 72% were on sick-leave during some period in their pregnancy. Ten per cent of these women were on sick-leave because of back problems (5).

Sick-leave alone does not eliminate LBP (2). A common treatment of LBP is physiotherapy. It has been shown that counseling and physical training may alleviate LBP and decrease the need for sick leave. Individual counseling and exercise appear to give better results than group treatment (3). Water-gymnastics has recently been reported to reduce the intensity of LBP in pregnant women (4). Acupuncture, an ancient method in the traditional Chinese medicine, has been used for millennia in the prevention and treatment of diseases. The concepts of traditional Chinese medicine differ markedly from those of western medicine. The effects of acupuncture in a western medical context have been discussed by Andersson (6). The use of acupuncture in the treatment of pain is based on the results of a large number of pre-clinical and clinical trials. Although the underlying mechanisms of action are still poorly understood, the somatic and autonomic nervous systems as well as the neuro-endocrine system are most likely involved.

The aim of this study was to describe the effects of acupuncture in the treatment of LBP in comparison with physiotherapy.

Materials and methods

The research ethics committee of the University of Linköping approved the study. Pregnant women living in the eastern part of Östergötland who were suffering from LBP with a gestational age of no more than 32 weeks were informed of the study and invited to participate. Sixty women who accepted the invitation and gave their informed consent entered the study, which was conducted from August 1996 through February 1997. By drawing a closed envelope from a box the participants were randomized to either acupuncture or physiotherapy.

Pain, disability and overall effect. The women estimated the severity of their pain using a visual

analog scale (VAS) from 0 to 10 where 0 denoted no pain and 10 worst possible pain. Similarly, disability in performing twelve common daily activities was estimated by the Disability Rating Index (DRI) (9), where 0 denoted no disability and 10 denoted maximal disability (i.e. inability). The activities are listed in Figs 3 and 4. Finally, the women rated the overall effect of their treatment on a categorical scale. The choices given are shown in Fig. 5.

Before treatment. All women were requested to fill in a questionnaire covering background data. They were examined by a midwife to confirm an otherwise normal pregnancy and a physiotherapist to confirm the presumed diagnosis of LBP. The diagnosis relied on patient history, a 'pain-drawing' by the patient indicating the location and type of pain, examination of the back and pelvis, and the results of provocation tests for pain originating from the pelvis and for pelvic instability (7, 8). The meaning and use of the VAS and how to keep notes of the readings in a pain-diary, were explained. Similarly, the meaning and use of the DRI were explained. The women were then requested to estimate the severity of their present pain and disability and the values were recorded ('before treatment'). Finally they were requested to report on any adverse events and especially on such events that might be related to their treatment.

During treatment. The women estimated the severity of their pain (VAS) every morning and evening.

After treatment. The women were again requested to fill in a questionnaire. They were asked to estimate their pain (VAS) and disability (DRI) ('after treatment') and to indicate the overall effect of their treatment. The questionnaire was returned at a post-treatment visit within a week after the last treatment.

Acupuncture. The treatment was given 3 times a week during the first two weeks, then twice a week, totalling 10 treatments within one month, each of 30 minutes. Sterilized steel acupuncture needles, 1–10 centimeters long and 0.25–0.38 mm thick were used. Two to ten needles were used. Treatments always started with ear-acupuncture, supplemented when needed by body-acupuncture. Acupuncture points in the fossa triangularis were used for ear-acupuncture. In body-acupuncture the needles were inserted in such manner that the so-called deqi-sensation was elicited. The most commonly used points were BI 26–30 and BI 60, Cw 2 and local points. For optimal stimulation the needles were gently tapped or rotated about 15 minutes after insertion.

Physiotherapy. The treatment was given once or twice a week, totalling 10 treatments within 6–8

Table I. Background data

	Acupuncture		Physiotherapy	
	Mean	Range	Mean	Range
Included in the study	30		30	
Exclusions	2 ¹		0	
Drop-outs	0		12 ²	
Included in the analysis	<i>n</i> =28		<i>n</i> =18	
Age on entry	Mean	Range	Mean	Range
Maternal age	28.4	(21–36)	29.4	(22–36)
Gestational age	24.2	(20–32)	24.2	(20–29)
Parity	Number	%	Number	%
Primiparas	8	(29%)	6	(33%)
Multiparas	20	(71%)	12	(66%)
Type of pain				
Pelvic pain	22	(79%)	10	(56%)
Low-back pain	0	(0%)	4*	(22%)*
Pelvic and low-back pain	6	(21%)	4	(22%)
On sick leave	8	(29%)	8	(44%)

¹ Received accidentally both acupuncture and physiotherapy.
² Pre-term contractions 3, delivered during the study 1, no pain-diary notes 1, pre-eclampsia 1, failed to attend treatments 3 and discontinued the study because of inconvenient treatment hours 3.
 * *p*<0.05.

weeks, 50 minutes each. The treatment was individualized according to the findings of the pre-treatment evaluation. All women were informed of the nature of the condition and counseled on daily activities, ergonomics, correction of faulty posture and how to perform the physical exercises according to a home training program. Those who were thought to benefit from pelvic support ('trochanter-belt'), warmth, massage, soft-tissue mobilization etc. were offered such treatment(s). Water-gymnastics once or twice a week was offered to all according to a defined program.

Statistics. Two-tailed Student's *t*-test was used to compare the differences of mean values between the groups. Chi square test was used to compare differences of proportions between the groups. A *p*-value less than 0.05 was regarded as statistically significant.

Results

In the acupuncture group all 30 women completed the study but two were excluded from analysis because they had accidentally also received physiotherapy. In the physiotherapy group only 18 women completed the study i.e. there were 12 drop-outs for various reasons (Table I). With respect to background data, intensity of pain and disability the two study groups were similar. However, there was a statistically significant difference in the distribution of type of pain between the two

groups. In the acupuncture group none (0%) was deemed to suffer from 'pure' low-back pain whereas in the physiotherapy group there were 4/18 (22%). In the acupuncture group most women reported a feeling of tiredness or sleepiness but also a sensation of wellbeing, after some of the first treatments. This effect waned during treatment. In the physiotherapy group many women experienced relieve from pain and disability from being immersed in warm water and being weightless during water-gymnastics. Also, the opportunity of seeing other women with the same problem and of exchanging opinions on how to cope was much appreciated. There were no serious adverse events related to either acupuncture or physiotherapy. All women delivered at term and all infants were in good health at birth. Two women reported small subcutaneous hematomas in the ear caused by acupuncture. In the physiotherapy group three women

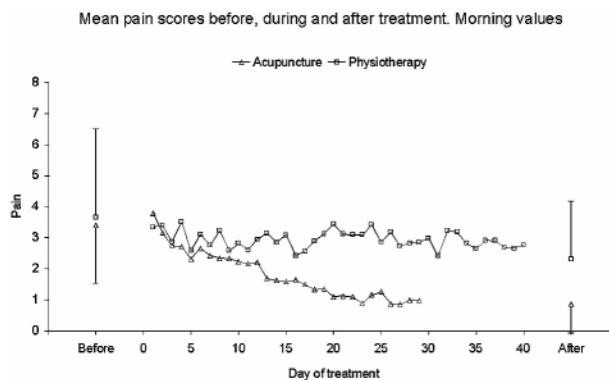


Fig. 1. Mean morning values of the estimated severity of pain on a visual analog scale (VAS) from 0 to 10 before, during and after treatment with acupuncture (*n*=28) or physiotherapy (*n*=18). Standard deviations of the means are given for the before and after treatment estimates.



Fig. 2. Mean evening values of the estimated severity of pain on a visual analog scale (VAS) from 0 to 10 before, during and after treatment with acupuncture (*n*=28) or physiotherapy (*n*=18). Standard deviations of the means are given for the before and after treatment estimates.

complained of pre-term uterine contractions, but none of them actually delivered pre-term. One woman developed pre-eclampsia. Another woman reported spells of absence on several occasions during water-gymnastics. She admitted that she had experienced such spells for a long time before she commenced physiotherapy. None of these five women (in the physiotherapy group) completed the study.

Pain. The mean VAS readings before, during and after treatment are given in Fig. 1 (morning values) and Fig. 2 (evening values). Throughout the study, pain was milder in the morning than in the evening. During treatment a trend could be seen toward diminishing VAS values in the acupuncture group and to a lesser extent in the physiotherapy group. After treatment, the mean VAS values in the acupuncture group were significantly lower both in comparison with the values



Fig. 3. Mean values of the estimated disability on a visual analog scale (Disability Rating Index, DRI) from 0 to 10 in performing common daily activities before and after treatment with acupuncture (n=28).



Fig. 4. Mean values of the estimated disability on a visual analog scale (Disability Rating Index, DRI) from 0 to 10 in performing common daily activities before and after treatment with physiotherapy (n=18).

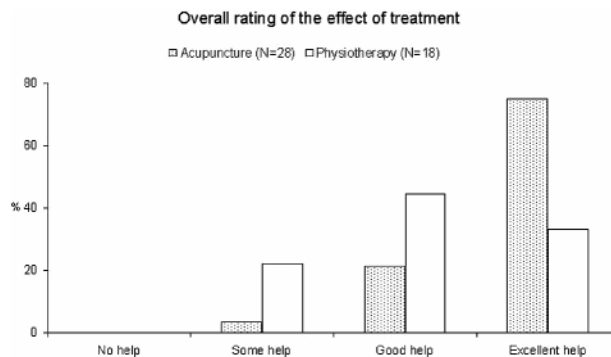


Fig. 5. Ratings of the overall effects of acupuncture (n=28) and physiotherapy (n=18) in the treatment of LBP.

before treatment (VAS 3.4 vs. 0.9 $p<0.01$ in the morning and VAS 7.4 vs. 1.7 $p<0.01$ in the evening) and in comparison with the values of the physiotherapy group ($p=0.02$ in the morning and $p<0.01$ in the evening). In the physiotherapy group the before-after treatment difference was statistically significant in the evening (VAS 6.6 vs. 4.5 $p<0.01$) but not in the morning (3.7 vs. 2.3 NS).

Disability. Before treatment the differences of mean DRI values between the acupuncture and the physiotherapy groups were insignificant. After treatment the mean DRI values were significantly less in the acupuncture group (Fig. 3) both in comparison with the values before treatment (except 'dressing/undressing') and with the corresponding values in the physiotherapy group (Fig. 4).

The ratings of the overall effects are given in Fig. 5. No woman thought that she had become worse. In the acupuncture group 27 of 28 women reported having received good or excellent help. In the physiotherapy group the corresponding numbers were 14 of 18.

Discussion

The main finding of this study is that acupuncture may relieve pain and disability in LBP. In a few cases the pain diminished after a single acupuncture treatment, but in most cases several treatments were needed to ease the pain. Physiotherapy did not relieve pain to the same extent but at least it halted the expected worsening during pregnancy (4). Acupuncture also diminished disability whereas physiotherapy did not. This surprised us. We had thought of acupuncture as an 'analgesic' whereas physiotherapy was thought to be a 'rehabilitizer' by increasing muscular strength and coordination to compensate for disability caused by instability. Furthermore, the women in the physiotherapy group received instructions on how to perform daily activities in order to avoid pain and worsening of dis-

ability, whereas the women in the acupuncture group received none. Thus we cannot explain this finding, but we speculate that the main cause of disability in LBP might be the pain, not the pelvic or lumbar instability *per se*. If so, the effect of acupuncture on disability in LBP might be due to its analgesic effect. From this point of view it might be interesting to compare common analgesics with acupuncture in the treatment of LBP.

In the acupuncture group all thirty women completed the study (although two were excluded from analysis), whereas there were twelve drop-outs in the physiotherapy group. Obviously this is a weak spot in our study. One can only speculate on the causes of the difference. One explanation may simply be chance. Another explanation may be that acupuncture was felt to be an easy treatment from the woman's point of view, whereas physiotherapy demanded active participation and physical exercise. Furthermore, in our setting acupuncture was regarded as a 'new' and 'alternative' treatment, whereas physiotherapy was considered 'old' and 'established'. Acupuncture was given individually, whereas physiotherapy was mainly given as group treatment. Thus, greater enthusiasm among, and closer relationship between, the women and their caregivers in the acupuncture group may have played a rôle. Finally, the women may have been more inclined to complete their treatment with acupuncture than physiotherapy because acupuncture was felt to be more effective than physiotherapy. However, the general satisfaction with the treatment was good in both groups.

It should be pointed out that this study reports on short term effects only. In most cases the low-back and pelvic pain in pregnancy will resolve spontaneously after delivery whether treated (e.g. with physiotherapy) or not. We have no reason to believe that it would be otherwise after treatment with acupuncture.

Conclusions

LBP is a common problem. Established treatments may be inadequate in relieving the symptoms. Therefore, better treatments are needed and acupuncture may turn out to be a complement to the existing treatments. In our opinion acupuncture is a simple, easy-to-learn, fairly cheap and safe treat-

ment, and we deem the results of our small study to be promising enough to warrant further studies to establish the rôle of acupuncture in the treatment of LBP.

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