

# Impact of prepartal acupuncture on labor and delivery

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Delivery is a natural process associated with a certain level of pain. With today's range of various pain relieving methods during labor, it is possible to shorten laboring, thus ensuring better compliance of parturient woman. Prepartal acupuncture is one of these methods. The results of this prospective study showed that prepartal acupuncture had a positive influence on pain experience of parturient women. There was no difference in duration of the first stage of labor between comparable groups, even in the primipara group. This study found acupuncture to have a positive influence on psychological state of the parturient women and general compliance during labor. Acupuncture should be considered as one of the possible methods for pain relief in labor and preparation for labor.

**KEY WORDS:** prepartal acupuncture, acupuncture, labor, delivery, pain relief

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## INTRODUCTION

Delivery is a natural process associated with a certain level of pain. Usually this pain is more tolerable if the labor is short (1). With today's range of various pain relieving methods during labor, it is possible to shorten laboring, thus ensuring better compliance of parturient women (2-5). Pharmacological treatment is frequently used, but the number of drugs that can be used during lactation is limited because of the possible adverse drug reactions in neonates (6,7). Acupuncture is one of the possible alternative therapies that has already gained recognition in several obstetric indications (8). Acupuncture therapy involves inserting thin steel needles through the skin at special points to exert its therapeutic effect. The positive effect of acupuncture on pain has been confirmed in many clinical studies, but only few have investigated its effect on pain relief and labor duration after prepartal acupuncture therapy (PPAC) (9).

The aim of this prospective study was to determine the effect of PPAC on labor and delivery. Our hypothesis was that the use of PPAC would shorten labor and reduce subjective patient pain sensation.

## SUBJECTS AND METHODS

The study was performed at the Department of Gynecology and Obstetrics, Sestre milosrdnice University Hospital Centre. It was designed as a prospective interventional randomized parallel longitudinal single-center study to evaluate the effects of PPAC on labor duration and subjective pain sensation of parturient women. The study was approved by the Hospital Board of Ethics (E.P. number: 14280/16-4), according to the Declaration of Helsinki Ethical Principles for Medical Research Involving Human Subjects, adopted by the 18<sup>th</sup> World Medical Assembly, Helsinki, Finland, June 1964, and as amended most recently by the 64<sup>th</sup> World Medical As-

sembly, Fontaleza, Brazil, October 2013. A written informed consent was obtained from all women enrolled in the study and they were recruited after obtaining the Board of Ethics approval. The women were allocated to either of the groups by using a heads-tails binary result coin toss method. Fifty-one women were included, 26 treated by PPAC and 25 women in control group. PPAC was applied from 36<sup>th</sup> week of pregnancy, once a week for 30 minutes. Acupunctural points used in this study influence cervical morphology (Gb34, St36 and Sp6) and psychological response (DM20, Ht7 and Pc6). Acupunctural points are applied symmetrically. We analyzed age, education level, number of previous deliveries, mode of delivery (vaginal/cesarean section), previous acupuncture experience, satisfaction with PPAC, side effects of PPAC, number of PPAC sessions, cervical dilatation at admission, regularity and frequency of contractions, duration of first stage and second stage of labor, pain during labor, pain two hours after delivery and during three days of hospital stay, and need for analgesics. Pain was evaluated on a 1-10 scale, but statistical analysis included only two groups: first group with pain 1-5 on the scale and second group with pain 6-10 on the scale. First stage of labor is defined as time before complete cervical dilatation, which is the beginning of second stage of labor that ends with delivery (10). Additional oral analgesics (NSAID) could be supplied at any time upon patient request during hospital stay. Oral ibuprofen was given as first line therapy, while oral paracetamol was given as second line therapy. Analgesic consumption was recorded.

The results were expressed as number for categorical

variables and as median value (25<sup>th</sup>-75<sup>th</sup> interquartile range) for continuous variables. Continuous variables were compared using Student's t-test for independent samples, while categorical variables were compared using  $\chi^2$ -test. All statistical tests were two tailed, and p values <0.05 were considered statistically significant. All statistical analyses were performed using MedCalc 9.5.1.0 (MedCalc Software, Mariakerke, Belgium).

## RESULTS

Twenty-five women were subjected to PPAC treatment. A significantly higher percentage of high school education was found in control group (p<0.01) and significantly more primiparae were found in PPAC group (p<0.16). Oral analgesics were used significantly more often in the PPAC group (p<0.02). There was no between-group difference in the mode of delivery, time from admission to delivery, and gynecologic findings at admission.

There was no between-group difference in the duration of first stage of labor ( $\chi^2=2.18$ , df=1, p>0.05) (Table 1). In the group of primiparae, there was no significant difference in the duration of first stage of labor ( $\chi^2=1.4$ , p>0.05, df=1) (Table 2). The  $\chi^2$ -test confirmed that the PPAC group had a lower incidence of strong pain experience ( $\chi^2= 5.06$ , df=1, p<0.02) (Table 3). There was no intergroup difference in delivery characterization (easy/heavy) ( $\chi^2=0.33$ , df=1, p>0.05) (Table 4). There was a significant shortening of second stage of labor in the control group ( $\chi^2=31.12$ , df=1, p<0.01) (Tables 5 and 6).

Table 1. Descriptive statistics

Sample	N	Education		Number of deliveries		Type of delivery		Maternal year of birth		
		High school	College	Primipara	Multipara	Vaginal	CS	<1980	1980-1990	>1990
Parturient women undergoing PPAC	26	2	24	23	3	24	2	1	25	0
Parturient women not undergoing PPAC	25	9	16	13	12	25	0	2	17	6

PPAC = prepartal acupuncture therapy; CS = cesarean section

Table 2. Observed and expected frequency of first stage of labor

	First stage of labor		
	<4 h	>4 h	
Control group	14	11	25
PPAC group	4	9	13
	18	20	38

Table 3. Observed and expected frequency of first labor stage duration considering only primiparae in control group

	First stage of labor		
	<4 h	>4 h	
Control group primiparae	6	7	13
PPAC group primiparae	4	9	13
	10	20	26

PPAC = prepartal acupuncture therapy

Table 4. Observed and expected levels of subjective pain assessment

	Pain experience		
	Mild	Strong	
Control group	1	24	25
PPAC group	7	19	26
	8	43	51

Table 5. Observed and expected grading of delivery associated pain

	Pain characterization		
	Mild	Severe	
Control group	20	5	25
PPAC group	19	7	26
	39	12	51

PPAC = prepartal acupuncture therapy

Table 6. Observed and expected duration of second stage of labor

	Second stage of labor		
	<1 h	>1 h	
Control group	12	13	25
PPAC group	2	11	13
	14	24	38

PPAC = prepartal acupuncture therapy

## DISCUSSION

Acupuncture has been practiced in China for more than 2000 years. Acupuncture as an additional treatment method has been applied in Western medicine since 1979 when the World Health Organization equalled acupuncture with other known methods of treatment in the Western medicine (11). Accepted indications for acupuncture in Western Europe are migraine, myalgia, ischialgia, edemas, sleep disorders and addictions. In obstetrics, acupuncture is used for nausea and vomiting, in prepartal preparation, for cesarean section, for delivery of placenta in third stage of labor, and for correction of fetal malposition. Acupuncture is a safe method without teratogenic effects, making it very convenient for obstetric use (12).

The use of acupuncture for relief of pain in labor is called prepartal preparation acupuncture and it has been used for twenty years now (13). Acupuncture helps in cervical shortening and dilatation influencing labor duration (14). Second stage of labor and time of delivery are not affected by this method. Psychological state of parturient women is greatly influenced in a positive way. PPAC starts at 36<sup>th</sup> week of pregnancy, once a week up to delivery. From 38<sup>th</sup> week, additional stimulation of uterine contractions is performed. Similar to previously reported findings, we did not find acupuncture to influence duration of first stage of labor. One of the possible reasons why the first stage of labor was not shortened in the PPAC group could lie in asymmetric grouping. In order to determine the exact relationship between PPAC and the duration of the first stage of labor, we should have had the same number of primiparae in PPAC and control group (15).

Most women had overall positive experience with acupuncture as in our study (16). Acupuncture relieves pain in labor, decreases the need for analgesics, forceps and vacuum use, and duration of labor. In cases of induced labor, acupuncture did not influence duration of labor (17). Acupuncture is an easily applicable and inexpensive method that is very well accepted by patients (18).

There are several hypotheses about analgesic effect of acupuncture. Some researchers claim that acupuncture

results in the release of endorphins and serotonin (19). Acupuncture stimulates increased uterine contractility by releasing oxytocin by central or parasympathetic uterine stimulation (20).

The effect on shortening the duration of the first stage of labor is especially important for primiparae because their labor duration is much longer than that of multiparae (21).

Our study showed that PPAC decreased pain experience in parturient women. One of the reasons why the first stage of labor was not shortened in the PPAC group were uneven groups. The groups did not have a proportional number of primiparae. This finding suggests that the duration of the first stage of labor is related to parity. In order to determine the exact relationship between PPAC and duration of the first stage of labor, we should have had the same number of primiparae in the PPAC and control groups (Table 7).

Table 7. Patient characteristics

Sample		PPAC group	Control group	p value	Statistical significance
<b>N</b>		<b>26</b>	<b>25</b>		
Age (years)	<28	0	6	0.02	Yes
	28-38	25	17		
	>38	1	2		
Education level	High school	2	9	0.01	Yes
	College	24	16		
Number of deliveries	Primipara	23	13	0.00	Yes
	Multipara	3	12		
Type of delivery	Vaginal	24	25	0.16	No
	CS	2	0		
Pregnancy follow-up	Normal	25	22	0.28	No
	Pathologic	1	3		
Time from admission to delivery (hours)	1 to 5	8	10	0.78	No
	5 to 10	10	8		
	>10	8	7		
Gynecologic examination findings	Closed	3	3	0.99	No
	Dilated 1-3 fingers	10	10		
	>3 fingers	13	12		
Analgesic use	Yes	22	14	0.02	Yes
	No	4	11		
Labor associated pain intensity	Mild	19	20	0.56	No
	Severe	7	5		

PPAC = prepartal acupuncture therapy; CS = cesarean section

## CONCLUSION

Preparations for labor and delivery have importance from the psychological, social, and physical point of

view. Good prepartal preparation guarantees better cooperation level between pregnant women and staff and better outcome of delivery. Analysis of the data obtained showed that PPAC had a positive effect on labor, although we could not demonstrate a positive influence on shortening of the first stage of labor. On the other hand, PPAC had positive effects on the maternal psychological status and reduced the subjective experience of pain, especially in women with an increased degree of anxiety. Although acupuncture is a relatively new method of prepartal preparation, it has its value in better compliance and shorter hospital stay. Properly applied acupuncture does not endanger the pregnant woman or the child and has no negative effect on pregnancy.

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## SAŽETAK

### UTJECAJ PREPARTALNE AKUPUNKTURE (PPAC) NA POROĐAJ

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Porodaj je prirodni proces povezan s određenom jačinom boli. Uz današnji raspon raznih metoda za ublažavanje boli moguće je porodaj i vremenski skratiti te time osigurati bolju suradnju roditelja. Prepartalna priprema akupunkturuom jedna je od takvih metoda. Rezultati ovoga prospektivnog istraživanja pokazali su da prepartalna priprema akupunkturuom djeluje pozitivno na roditelje u smislu subjektivno manjeg osjećaja boli, no nismo uspjeli potvrditi da skraćuje prvu porođajnu dob. U skupini roditelja koje su bile na prepartalnoj pripremi akupunkturuom 7/26 roditelja je porodaj smatralo laganim za razliku od skupine roditelja koje nisu prošle prepartalnu pripremu akupunkturuom, gdje je samo 1/25 roditelja porodaj smatrala laganim. Analizom trajanja prve porođajne dobi nije bilo statistički značajne razlike među skupinama (trajanje prve porođajne dobi kraće od 4 sata imalo je 14/25 žena u kontrolnoj skupini, a samo 4/13 žena u akupunkturuom skupini). Između skupina nije bilo ni statistički značajne razlike u trajanju prve porođajne dobi ni kada su se uzele u obzir samo prvorođkinje (trajanje prve porođajne dobi kraće od 4 sata imalo je 6/13 žena u kontrolnoj skupini i samo 4/16 žena u akupunkturuom skupini). Ovo istraživanje ukazuje na pozitivan utjecaj prepartalne pripreme akupunkturuom na psihičku stabilnost roditelja i dobru suradljivost te na važnost podizanja svijesti o akupunkturuom kao mogućnosti jedne od metoda pripreme za porodaj.

**KLJUČNE RIJEČI:** prepartalna priprema akupunkturuom (PPAC), akupunktura, porodaj, bol