



EFFECTIVENESS OF ICE MASSAGE ON LI4 ACUPRESSURE MERIDIAN POINT IN LABOUR PAIN PERCEPTION AMONG THE PARTURIENT MOTHERS

DR.PROF.K.LATHA*¹

Professor & HOD –Department of Obstetrics and Gynecology Nursing, SRM College of Nursing, SRM University

ABSTRACT

Over the years, labour pain management studies have focused on the use of drugs that affect sensory awareness of pain, which may have the additional effect of impeding women's active participation in giving birth. So any technique that provides safe and effective pain reduction without serious side effects can be given by any health professionals is a definite advance. To assess the effect of ice massage on LI4 acupressure meridian point in labour pain perception, a quantitative approach, randomized time series clinical trial on 180 parturient mothers by simple random sampling was conducted. Multiple institution of ice massage over the LI 4 (Large intestine 4) acupressure meridian point on the left hand of the parturient mothers was given. Subjects were assessed for pre and post test labour pain perception using Visual analogue scale. Results showed a high statistical significant difference in the perception of labour pain at $p < 0.001$ level ($t=19.93$, $p=0.001^{***}$). Study concluded that ice massage over the LI4 acupressure meridian point was effective in the reduction of the labour pain perception, and hence it can be a safe and effective tool to reduce the intensity and the unpleasantness of pain from early labour contractions.

KEY WORDS: Acupressure, LI4 (large intestine) meridian point, Ice massage, Parturient mothers, Labour pain perception, CAM (Complementary Alternative Medicine)



DR.PROF.K.LATHA

Professor & HOD –Department of Obstetrics and Gynecology Nursing,
SRM College of Nursing, SRM University

*Corresponding author

INTRODUCTION

A women's experience of labor pain is influenced by many elements including her past experience of pain, her coping abilities, the birthing environment, and her psychological factors. Chapman (2002),¹ describes labor pain as stimuli of receptive neurons arising from contractions of the uterine muscles, which are referred to as the visceral, pelvic and lumbar –sacral areas. In first stage of labour, pain is largely visceral in origin, where else during the transitional and second stages of labour somatic pain become more pronounced. Comfort in labour is not merely an emotional or physical relieving of malaise and pain. It is a complex process in which the midwife combines research based knowledge and skills with warmth, empathy and sensitivity in order to provide a birth environment which is safe, caring, and conducive to a satisfying birth experience. Complementary and alternative medicine (CAM) has witnessed an increase in use in recent times not only in North America, Europe, and Australia, but also in Asian countries including India.² In India, alternative systems such as Ayurveda, Homoeopathy, Siddha, and Unani medicine are supported by the Government of India.³ CAM practices and modern, allopathic medicine run parallel to each other, and may cater to the rural and urban populations, respectively, though not mutually exclusively.³ In addition, other practices such as yoga asana, pranayama, massage, acupuncture, and magnet therapy are also used in India. CAM therapies cater to a large proportion of the Indian population.⁴ According to a review conducted by Michael and Anne, which evaluated the effect of complementary and alternative medicine on pain during labor with conventional scientific methods using electronic data bases through 2006, revealed that many studies did not meet the scientific inclusion criteria. According to the randomized control trials, the review concluded that for the decrease of labor pain and/or reduction of the need for conventional analgesic methods, there was an efficacy found for acupressure and sterile water blocks. Most results favored some efficacy for acupuncture and hydrotherapy.⁵ Even though there has been enormous growth in Complementary Alternative Medicine (CAM) research in the past decade, few well–designed studies on the use of complementary alternative medicine in pregnancy or child birth have been conducted. Some of the most interesting of the studies are those based in traditional

Chinese medicine, which is a complex ancient system of healing that includes the use of acupuncture, acupressure (acupuncture without needles), moxibustion (stimulation of acupressure points with heat from a burning herb), massage, diet, herbs, and exercise to promote health and treat disease.⁶ Despite the exponential growth of research on traditional Chinese medicine in the past decade, the mechanism of action of acupuncture, acupressure, and the moxibustion are still largely unexplained in the western scientific model.⁷ Western research (2006)⁸, on the use of traditional Chinese medicine in obstetrics has focused on effect of acupuncture / acupressure on nausea and vomiting during pregnancy and the use of moxibustion for breech version.⁵ Many studies on the use of acupuncture for labour induction and labour analgesia were carried out but there were problems with the study methods including small sample sizes, the variety of methods for assessing the pain. Ice is commonly used to reduce pain of perineal lacerations or episiotomy in the post partum period. The early work of Denny brown et al (2005)⁹, showed that cold temperatures effectively blocks nerve conduction in sensory fibers. Grant (2009)¹⁰, advocated massage with ice for the treatment of musculoskeletal system pain and named his technique as cryokinetics. Melzack et al, (2007)^{11, 12} found that intense sensory input produced by ice massage of the web between the thumb and the forefinger resulted in 50% reduction of dental pain. The researchers hypothesized that the efficacy of ice massage was due to engaging the gate control pain system rather than eliminating the source of the pain. When impulses are reaching the spine pathway to the brain are stimulated by techniques such as vibration, scratching or ice massage, the gate closes, resulting in a decrease in the sensation of pain.

Large intestine energy meridian point 4 (LI 4)

LI4 is bilateral and begins in the surface of the skin at the root of the index finger nail. The pathway moves from the tip of the forefinger up to the face and circles the teeth. It bifurcates at the shoulders to move downward wrapping around the entire colon. At term, the colon practically encircles the upper portion of the uterus. The location of LI4 is a point where the energy flow of the meridian is closest to the skin and can be easily stimulated with pressure, needles, or extreme cold and pressure.¹³ (Figure 1)

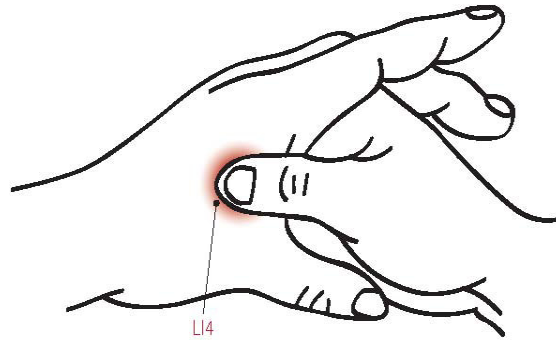


Figure 1
Showing the LI4 (Large Intestine Acupressure Meridian point)

Acupressure as an alternative complementary therapy is a natural treatment modality, which has no side effects and only pressure is applied to the meridian point, where only the hands of the midwives and willingness to know the feedback of the mothers are needed for its effective use. To date, Labor pain management studies have focused on the use of drugs that affect sensory awareness of pain, which may have the additional effect of impeding women's active participation in giving birth. So, this made the researcher to investigate the effectiveness of acupressure on labor pain management without any side effects, which could be given by any health professionals, is of a definite advance in the midwifery approach to labor management. The aim of the study is to assess the effectiveness of ice massage on the LI4 acupressure meridian point in labour pain perception among the parturient mothers.

1. To

MATERIALS AND METHODS

A Quantitative approach time series design, randomized clinical trial was conducted at the first stage of labour unit at Government hospital Tambaram. 180 parturient mothers between 37-41 weeks of gestation in first stage of labour, who fulfilled the inclusion criteria, were selected by simple random sampling (lottery method). The sample size calculation was made on the basis of the pilot study results. 172 samples were required to have a difference of 5% in $P < 0.05$ level of significance at 80% power. Samples were then rounded to 180 parturient mothers.

Inclusion criteria

Inclusion criteria for the study includes a) mothers at active phase of labour, b) mothers with singleton pregnancy between 2.5 – 3 kg fetal weight, c) Vertex presentation revealed by USG by the registered medical practitioner, d) adequate pelvis assessed per vaginam with cervical changes between 0-7 cm.

Exclusion criteria

Exclusion criteria for the study includes, a) mothers whose labour was induced, b) who had narcotics, pain killers, epidural analgesia in the past 8 hours, c) mothers

with any underlying medical illness, d) who had complicating pregnancy like Pre-eclampsia, diabetes, e) who develops complications during the course of labour like obstructed labour etc.

Ethical consideration

The study protocol was approved by the Institutional review board, SRM College of Nursing. (Ethical clearance no. 96/EC/2014) Formal GO was obtained from the Directorate of Medical education, Chennai. Informed written consent was obtained from all the participants and were requested to participate voluntarily in this study. Third party consent from the authorized representative of the mothers was also obtained.

Tools used for the study

Section I

Structured questionnaire to assess the socio-demographic & clinical variables of the parturient mothers.

The socio – demographic data of the parturient mothers includes age, education, Occupation, Religion, type of work, type of family, socio economic status. Clinical variables include gestational age, parity, cervical dilatation, etc. Variables were assessed by interview schedule in the local language and the related information was retrieved antenatal records by the investigator.

Section II

Tool for assessing the level of labour pain perception of the parturient mothers

Visual Analogue Scale (VAS) used for the study is the measurement instrument that measures the labor pain range across a continuum of values 0-10. Operationally a VAS it is a horizontal line, 100 mm in length, anchored by word descriptors 0- No pain, 0.1- 2.5 – mild pain, 2.6- 5.0 – Moderate pain, 5.1-7.5 – Severe pain, 7.6- 10.0 – excruciating pain. The parturient mother marks on the line the point that they feel represents their perception of labour pain. The VAS score is determined by measuring in points from 0.1 - 10 from the left hand end of the line to the point that the mother marks. The reliability of the tool was established by inter-rater method. The spearman correlation co-efficient $r = 0.9$, indicated high positive correlation and hence the tool was found reliable

Description of the intervention

With consent and confidentiality assured, brief explanation about the pain scale and its purpose was done. Pre-assessment of labour pain perception was obtained for the first 4 subsequent contractions, followed by ice massage i.e by rocking back and forth over the acupressure meridian point of the left hand by a small ice bag on the LI 4 meridian point (LI 4 meridian point is located on the medial midpoint of the first metacarpal within 3- 4 mm of the skin between the thumb and the fore finger). Ice bag was prepared by crushing 1/3rd of a cup of crushed ice placed in the centre of a soft, thin terry wash square cloth measuring 4 inches and the four corners of the cloth is lifted to the centre and twisted to make a small ice bag. Post assessment of labor pain perception was done immediately after the next 4 subsequent contractions using the visual analogue scale.

Statistical data processing

Statistical package for social sciences (SPSS) version 16, IBM, Chicago, USA and InStat were used for the data analysis. Frequency and percentage distribution was used to distribute the variables. Mean, Standard deviation and paired't' test were used to compare the pre

and post assessment data scores of the labour pain perception. Chi square analysis was used to associate the demographic variables with level of pain perception of the parturient mothers. There was no attrition present and data was computed for 180 parturient mothers.

RESULTS**Section I****Frequency and percentage distribution of the socio-demographic and the clinical variables parturient mothers**

Frequency and percentage distribution of socio demographic and the clinical variables of the parturient mothers revealed that majority of them 138(76.7%) were housewives, 110(61.1%) were educated up to high school , 94(52.3%) does a moderate work pattern, 136 (75.6%) of them were Hindus, 154(85.6%) of them were house wives, 156(86.7%) were between 37-39 weeks of gestation at the time of delivery, 114(63.4%) of them were primi gravid mothers and majority 154 (85.6%) of them in 3-5 cms of cervical dilatation during the time of the study.

Section II**Pre and post assessment level of labour pain perception of the parturient mothers**

Table 1
Frequency and percentage distribution of the pre-assessment level of labour pain perception by the parturient mothers

N=180		
Level of labour pain perception	Frequency (n)	Percentage (%)
No Pain	-	-
Mild pain	-	-
Moderate pain	32	17.8
Severe pain	110	61.1
Excruciating pain	38	21.1

(Table 1) Pre assessment level of labour pain perception by the parturient mothers reveals that majority 110 (61.1%) of them had severe pain, 38 (21.1%) of them had excruciating pain and 32 (17.8 %) of them had moderate pain before the intervention.

Table 2
Frequency and percentage distribution of the post-assessment level of labour pain perception by the parturient mothers

N=180		
Level of labour pain perception	Frequency (n)	Percentage (%)
No Pain	-	-
Mild pain	44	24.4
Moderate pain	102	56.7
Severe pain	30	16.7
Excruciating pain	4	2.2

(Table 2) Post assessment level of labour pain perception by the parturient mothers reveals that majority 102 (56.7%) of them had moderate pain, 44 (24.4%) of them had mild pain and 30 (16.7 %) of them had severe pain before the intervention and 4 (2.2%) of them had excruciating pain.

Table 3
Mean and standard deviation of the pre and post assessment level of labour pain perceived by the parturient mothers

Labour pain perceived by the parturient mothers	Pre- assessment		Post assessment	
	Mean	Standard deviation	Mean	Standard deviation
	72.1	1.34	41.7	1.72

Table 3 reveals that there is a marked mean difference of 30.4 in the labor pain perception from the mean value of 72.1 in the pre assessment to 41.7 in the post assessment.

Graph 1

Mean & Standard deviation of labour pain perception of the parturient mothers before and after intervention

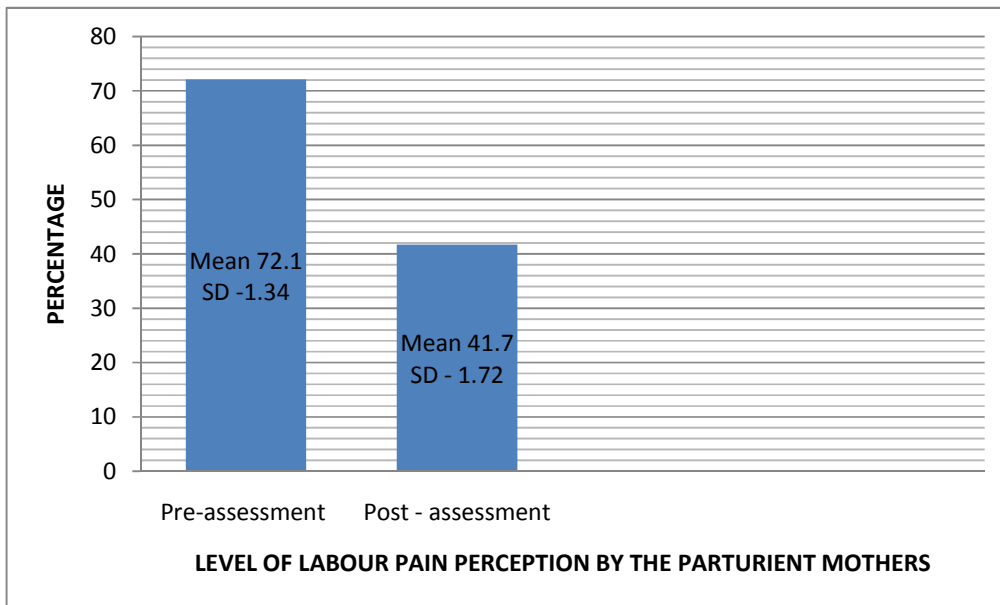


Table 4

Effectiveness of ice massage over LI4 acupressure meridian point on labour pain perception by the parturient mothers

Level of labour pain perception	Mean difference	Standard Deviation	Paired "t" test P value
	30.5	1.17	19.93 p=0.001***

*significant at $p < 0.05$, **highly significant at $p < 0.01$, ***very high significance $p < 0.001$

Table 4 denotes that there is a significant difference in the level of labour pain perceived by the parturient mothers with a mean difference of 30.5 at $t=19.93$, $p=0.001$ level, which proves the effectiveness of ice massage on the LI4 acupressure meridian point in reduction of labour pain.

Association of the post assessment level of labour pain perceived by the parturient mothers with their socio demographic and clinical variables

There was a statistical significant association found between the level of labour pain perceived by the parturient mothers with the socio demographic and clinical variables like work pattern at $\chi^2 = 31.80$, $p < 0.05$ and occupation at $\chi^2 = 9.64$, $p < 0.05$ level, whereas

there was no statistical significant association found with the remaining variables of the study.

DISCUSSION

Majority of the parturient mothers belonged to the age group of 20-25 years and were house wives. Most of them were educated upto high school and had a moderate working pattern. Clinical variables of the parturient mother's shows that majority of them were between the gestational ages between 37-39 weeks with 3-5 cm of cervical dilation at the time of the intervention in the study. Majority 110 (61.1%), of the parturient mothers in the pre-assessment of labour pain were found to have severe pain and none of the mothers were found to have mild or no pain. This reflects the need for a

midwifery approach that would help parturient mothers for managing their labour pain. Eventually in the post assessment of labour pain after ice massage on the LI4 acupressure meridian point showed that most of the parturient mothers 102 (56.7%) had moderate pain and 44(24.4%) of them had mild pain, whereas only 4(2.2%) mothers was found to have excruciating pain. Comparison of the pre and post assessment level of labor pain perception by the parturient mothers revealed a decrease in the mean pain level of 30.5. The computed paired 't' test was statistically significant at $p < 0.001$ level, which strongly indicates a decrease in the post assessment labor pain perceived by the parturient mothers after the intervention. This proves the effectiveness of ice massage on the LI4 acupressure meridian point on the left hand in reduction of labour pain among the parturient mothers. Similar findings were obtained from the study conducted by the Hajjiamini Z et al,¹⁴ which compared the effects of ice massage and acupressure on labour pain reduction, showed a significant difference in the labour pain perceived by ice massage than acupressure at $p < 0.05$, suggests that repeating these techniques during the first stage of labor could be an effective, accessible, cost-effective and non-invasive technique to help reduce the intensity of labor pain. The results of this study were consistent with other studies done in this field. Chung and colleagues studied the effect of L14 and BL67 acupressure on labor pain and uterine contractions and found a significant difference in pain intensity after the intervention. However, in the transitional labor phase no pain reduction was observed.¹⁵ Studies by Enjezab et al,¹⁶ and Waters et al.¹⁷ showed that using ice massage on the Hego point decreased pain intensity 30 minutes after intervention., In addition, Fan Qu studied the effect of electro-acupuncture on points L14 and SP6 on the intensity of labor and concluded that the technique could cause reduction in pain during the active phase.¹⁸ Another study showed that applying acupuncture on specific points such as LI4 compared to ineffective points could reduce labor pain in 30 minutes, one to two hours after the intervention.¹⁹ Hence the research hypothesis stating that "There will be a significant difference between the pre and post assessment of labour pain perception among the parturient mothers" was accepted at $p < 0.001$ level.

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Limitations

Ice massage was limited to be performed in the early hours of labour and the effects may not be generalized to pain control later in labour, since labour pain grows closer together and more intense. No attempt could be made to monitor the participants continued use of ice massage on the LI4 acupressure meridian point due to time constraints.

CONCLUSION

The present study assessed the effectiveness of ice massage on the LI 4 acupressure meridian point in labour pain perception among the parturient mothers. The findings suggests that Ice massage on the LI4 acupressure meridian point would be a suitable non pharmacological technique in reducing the labor pain in the active phase of labor without any side effects compared to the pharmacological methods, can be added to other tools used by midwives, nurses and other health professionals. According to the World Health Organization's policies to reduce the rate of cesarean deliveries and promotion of safe childbirth, it is necessary to make childbearing pleasant and reduce maternal fear of natural childbirth using safe methods to reduce labor pain and increase the rate of vaginal delivery. In order to make this possible, midwives need training in using non-pharmacological techniques and the attitudes and policies of the hospitals need to be altered. Due to the simplicity and safety of the acupressure technique, additional research using a larger sample size and in combination with other techniques to apply pressure on different points of the body is suggested.

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CONFLICT OF INTEREST

There is no conflict of Interest to declare.

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