Effect of laser acupuncture for induction of labor

THESIS
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Abstract

Objective: To evaluate the utility of outpatient laser acupuncture for labor induction.

Design: Randomized controlled single blinded trial to compare active and sham laser acupuncture.

Population: A total of 60 nulliparous induced labor at post term. Nulliparous women beyond 42 weeks with a singleton gestation and randomized into two groups:

Group I (control group) n=30.

versus Group II (study group) n=30,

Methods: women treated with sham laser for (control group) and active laser for (study group) over four traditional acupuncture points.

Main outcome: The primary outcome was interval from the time of enrollment to delivery. Secondary outcome was the rate of vaginal delivery, caesarean section, adverse reactions, patient satisfaction with low level laser therapy and fetal wellbeing.

Result : Mean time of enrollment to delivery differ between groups (p=0.4). Acupuncture group could proceed to normal vaginal delivery more often than control group (p = 0.01).

Conclusion: Acupuncture is well tolerated among term nulliparous women and holds promise in inducing labor, in post term pregnancies with no apparent fetal compromise .

Keywords: Labor, acupuncture, induction.

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List of abbreviation

ACTH	:	Adreno -cortoic - trophic hormones
Bl	:	Bladder
CS	:	Caesarean section
Gl, Al, As:		Gallium, Aluminum, Arsinic
Hs	:	Hormones
LLLT	:	Low Level Laser therapy
LI	:	Large intestine
mW	:	Mill Watt
nm	:	Nano meter
NO	:	Nitros oxide
OT	:	Oxytocin
SP	:	Spleen
TCM	:	Traditional Chinese medicine
UB	:	Urinary bladder
USA	:	United States of America
VAS	:	Visual base scale

Definition of terminology

Acupuncture: It is a method of prevention or treatment of the dise puncturing certain points of the human body with metal needles .

Laser: Is an acronym for light amplification by stimulated emission of radiation

Coherence : Properly of identical phase and time retaliation shape, all photons of laser light are same wave length.

Interact effect: A decreased response that occurs in deeper tissue.

Wave length : The distance from peak ot same point on the next peak of an electromagnetic or acoustic wave.

Diode laser : A solid state semiconductor used as a lasing medium.

Moxibustion : Is the application of small variously pieces of the process megwort plant on the surface so the heat of the burning herb stimulate the acupoint.

Sanyinjiao: SP6, Its an acupuncture point, it is one of 6 distal points, and one general tonification point, san means 3, Jiao means junction, by Chinese, sanjiano means the junction of three yin channel.

Location: 3 cm above the tipe of medial malleous on the medial border of the tibia.

Indication : Gaster-intestinal disorders, muscle disorder, skin disorder it is one of general tonificaation point.

Puncture : 1.0 cm perpendicularly.

Huge : (Large intestine 4) It is an acupuncture point, it is one of most important of the 6 distal points , it is general tonification point and it has an analgesic properties.

Location: It is suited in the web between the forefinger and thumb on the posterior aspect of the hand , and it located when the forefinger and the thumb are adducted, at the highest point of the muscles on the back of the hand.

Cillio (BL31): Located in back on sacral bone midway between the middleline and 1st sacral foramen on the bilateral bladder meridian.

Shiaglio (BL 32): Located in back on sacral bone mid way between the midl line and the 2nd sacral foramen on the bilateral bladder meridian which has direct effect on the uterus.

Function: Normalize of the physiological function of the uterus and ovaries and hormones secretion. Increase uterine contraction during labor.

Yin meridian: The energy channel in the flexor muscle.

Yang meridian: The energy channel in extensor muscle.

Introduction

In 2003, 7% of all deliveries occurred after 42 weeks of gestation [1]. Post term pregnancies are known to be greater risk for fetal and maternal morbidity and mortality. Up to a six-fold increase in prenatal mortality has been reported between pregnancies delivering at term [2]. Neonatal post-term complications include dys-maturity syndrome with placental insufficiency, birth trauma from macrosomia, and meconium aspiration syndrome [3]. Additionally, lower umbilical artery pH levels and 5-minute Apgar scores are associated with delivery after 42 weeks [4]. Maternal risks include a two-fold increase in caesarean delivery at the 42nd week when compared with 40 week of gestation [4]. Current guidelines recommend closely monitoring fetal wellbeing and awaiting cervical favorability from 41- 42 weeks with labor induction planning based on these factors [4]. However, some women find induction of labor less desirable, spontaneous labor, and induction has been associated with an increased rate of caesarean section [5'6]. Labor is a process through which the fetus moves from the intrauterine to the extrauterine environment. It's defined as the initiation and perpetuation of uterine contractions with the goal of producing progressive cervical effacement and dilation. The exact mechanisms responsible for this process are currently not well understood. Induction of labor refers to the process whereby uterine contractions are initiated by medical or surgical means before the onset of spontaneous labor. When the Bishop score is less than six, it is recommended that a cervical ripening agent (PGE2) be used before labor induction [6]. Non-pharmacologic approaches to cervical ripening and labor induction include herbal compounds, castor oil, hot baths, sexual intercourse, breast stimulation, acupuncture, acupressure, trans-coetaneous nerve stimulation, mechanical and surgical modalities. Of these Non-

pharmacologic methods, only the surgical and mechanical methods have proven efficacy for cervical ripening or induction of labor [7].

Pharmacologic agents available for cervical ripening and labor induction include prostaglandins, misoprostol, mifepristone, and relaxin. When the Bishop score is favorable, the preferred pharmacologic agent is oxytocin, but the risk of rupture uterus increasing or increase fetal heart rate [8]. Acupuncture is widely accepted in Western societies for several obstetric indications. Acupuncture does not show any statistical significant maternal or fetal risks [9], which has been shown to be safe and effective in randomized clinical trials for correction of breech presentation and treatment of hyper-emesis gravidarum [10]. The Shanghai College of Traditional Medicine text recommends acupuncture for labor induction and it is used routinely for labor induction in some societies [11].

Aim of the study

Our aim of this study was to detect the effect of laser acupuncture on induction of labor in postterm primigravida, and to find any complications from using laser acupuncture. Also, to detect the outcome of induction weather normal or caesarean section, to assess the fetal wellbeing and its conditions, and any complications as fetal stress while using laser acupuncture.

Labor Induction

The decision to bring pregnancy to an end before the spontaneous onset of labor is one of the most drastic ways of intervening in the natural history of pregnancy and childbirth. Elective caesarean section range from the life saving to the trivial. The reasons given for elective delivery may be achieved by either inducing labor or elective section. There has been very controlled research on the induction for elective delivery; most research has been concerned with method to implement elective delivery [**12]**.

Although comparison of these methods are secondary to the more fundamental question of when or where an elective delivery is required. Once the decision of elective delivery was made, the method chosen becomes important. If induction of labor and vaginal delivery is planned, attention to the state of the cervix is essential. Induction of labor is the artificial initiation of uterine contractions prior to their spontaneous onset leading to progressive dilatation and softening of the cervix and delivery of the baby, the term is usually restricted to pregnancies at gestation greater than the legal definition of fetal viability (24 weeks in the united kingdom) **[13].** The rate of induction varies widely in different countries and units and between individual obstetricians within the same unit. Such variation may be due to differences in the incidence of indications of induction (post maturity or hypertension), availability of resources, as well as to unexplained differences in opinion and practice **[14].**

According to the American National Center for health statistics, the overall rate of induction of labor in the United States has increased from 90 per 1,000 live births in 1989 to 184 per 1,000 live births in 1997 **[15].**

Labor is induced in more than 13% of deliveries in the United States. Postterm pregnancy is the most common indication. Oxytocin is the drug of choice for labor induction when the cervical examination shows that the cervix is favorable in a patient whose cervix is unfavorable, the use of prostaglandins analogs for cervical ripening markedly enhances the success of induction rates between
10 % and 25 % are common in industrialized countries [15].

In a comparative study between different centers in the USA, they found that the induction of post term labor has almost the most common indication during the past 15 years, post date pregnancy and elective induction prevalence often applied to gestation of 40 to 41 weeks duration. The rates and indication of labor induction differ also according to hospitals. In a comparative study between a university hospital and two community hospitals among labor induction cases, they found that the indications for labor induction were different between university and community hospitals however; the more frequent inductions at the community hospitals did not result in higher caesarean rate. The purpose of induction is to achieve benefit to health of the mother and / or baby greater than if the pregnancy continues [16].

In the United Kingdom the most common indication is post term. There is good evidence that induction of labor should be offered routinely to all women whose pregnancies continue beyond 42 weeks gestation. Induction of labor during the period is association with beneficial outcome in terms of reduced caesarean section [**17].**

There are different methods of labor induction:-

1-Pre-induction cervical assessment

Normally, the effective force of the 1st stage of labor is the uterine contraction, which in turn, exerts hydrostatic pressure through the fetal membranes against the cervix and lower uterine segment. In the absence of fetal membranes, the presenting part of the fetus is directly forced against the cervix and lower uterine segment. As the result of the action of these force, two fundamental changes (effacement and dilation) – take place in the already softened cervix.

For 'the head of the average fetus at term pass through the cervix, the cervical canal must dilate to a diameter of 10 cm. At this time, the cervix is said to be fully dilated. During the 1st stage, there may be no fetal descents somewhat as the cervix dilates, that may lead to prolonged 1st stage. During the second stage of labor, descent of the fetal presenting part typically occurs rather slowly but steadily in nullipara. In multiparas, particularly those of high parity descent may be very rapid [18].

Composition of the cervix:

There are three principal structural of the cervix: collagen, smooth muscle, and the connective or ground substance. Constituents of the cervix are important in cervical modification at parturition are those in the extracellular matrix and ground substance, the glycosaminoglycans, dermatan sulfate, and hyaluronic acid. The smooth muscle content of the cervix is much less than that of the funds, and varies anatomically from 25% to only 6%**.** Cervical modification during phase parturition principally involves changes that occur in hyaluronic acids is associated with the capacity of a tissue to retain water in collagen, connective tissue and its ground substance [19].

Cervical softening is associated with two complementary changes**:**

- Collagen breakdown and rearrangement of collagen fibers.
- Alterations in the relative amounts of various glycosaminoglycans.

At term, there is a striking increase in the relative amount of hyaluronic acid in the cervix, with a concomitant decrease in dermaten sulfate. The role of smooth muscle in cervical softening process is not clear, but may be more important than previously believed [**20].**The American College of Obstetricians and Gynecologists (MCOG 2009), determined that when the Bishop scores exceeded, the incidence of vaginal delivery, subsequent to labor induction was not significantly lowered than spontaneous vaginal delivery without induction.

A cervical Bishop score of at least six is considered favorable and likely results in success of labor. Many factors have evaluated and confirmed the validity of Bishop scores, among the factors considered in assigning the score, the strongest association with successful labor seems to be with cervical effacement [**21].**

Predicting successful induction of labor

Induction of labor is preformed in a variety of clinical situations when the benefit of delivery out weights the risks of continuing the pregnancy and the induction itself. According to some reports, as many as 25% to 30% of pregnancies end with induction of labor, and this number may be rising. The identification of patients who are going to have a safe and fast induction of labor is thus important; systems of quantifying and scoring cervical factors have been sought for years to predict the duration of labor and determine which patients may successfully and safely undergoes induction of labor. More than 35 years

ago, Bishop established a cervical scoring system based on a clinical assessment of the cervix, which involved an evaluation of cervical dilatation effacement, position, and consistency, and the station of the presenting part. The Bishop score