Elective Induction of Labor in Normal pregnant Multiparous Women at 39 Weeks Versus Expectant Management; Randomized Controlled Trial

Thesis

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By

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بسم الله الرحمن الرحيم
قالوا
سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم
صدق الله العظيم
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Mohamed Mahmoud Ahmed Arafa

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List of Abbreviations

Abbr.	Full-term
AC	**:** Abdominal circumference
ACOG	**:** American College of Obstetricians and Gynecologists
AUC	**:** Area under Curve
BMI	**:** Body mass index
BPD	**:** Biparietal diameter
CL	**:** Cervical length
CRF	**:** Corticotropin-releasing factor
CS	**:** Cesarean section
CTG	**:** Cardiotocography
ECM	**:** Extracellular matrix
EDC	**:** Estimated date of confinement
EP	**:** Prostaglandin E2 **receptor**
FHR	**:** Fetal heart rate
FL	**:** Femur length
GA	**:** Gestational age
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h	**:** hours
IL	**:** Interleukin
IMN	**:** isosorbide mononitrate
IOL	**:** Induction of labor

IUD : Intra uterine Device

mcg : Micrograms

mg : milligrams

MLCK : Myosin light-chain kinase

MLCP : Myosin light chain phosphatase

MMPs : matrix-metalloproteinases

MPA : Misoprostol acid

NICU : Neonatal intensive care unit

NMII : Nonmedically indicated induction of labor

PAF : Platelet activating factor

PGE : Prostaglandin E

PKA : Protein Kinase A

PPH : Post-partum hemorrhage

RCT : Randomized controlled trial

SD : Standard Deviation

SMFM : Society for Maternal-Fetal Medicine

SPSS : Statistical Package for Social Sciences

SROM : Spontaneous Rupture of membrane

TVU : Transvaginal ultrasound

VD : Vaginal delivery

WHO : World Health organization

µcg : Micrograms

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Abstract

Background: The physiological and anatomical mechanisms interacting to maintain pregnancy and trigger the labor process are far complex and require research efforts that could elucidate the factors that could trigger the physiological gradual cervical effacement and dilatation that would finally result in delivery at appropriate timing without jeopardization of maternal and fetal clinical situations. **Aim of the Work:** to compare the clinical outcomes of elective induction of labor at 39 weeks in multiparous women versus expectant management. **Patients and Methods:** A prospective clinical research study recruited 150 research study subjects, inclusive research criteria research criteria involved the following Normal pregnant multiparous women, Sure of dates and confirmed by sonography, gestational age 39-40+6 weeks, singleton pregnancy, Age range from 20 to 40 years, reactive fetal non-stress test. Exclusive research criteria involved the presence of any contraindication for vaginal delivery (e.g. placenta Previa, accrete … etc.) contraindications for induction of labor (e.g. fetal malpresentation, prior uterine surgery), cases having active labor, antepartum hemorrhage, eclampsia, cases having hemolysis, elevated liver enzymes and low platelets, clinically suspected chorioamnionitis, IUGR, multiple gestation, non-reassuring fetal heart rate, IUFD, cases that refused to participate in the research study, cases have been randomized into two equal numbered research groups the induction and spontaneous research groups. **Results:** CS was statistically significantly most frequent in selective induction research group (p value=0.001) with no statistical significant difference between elective induction and spontaneous onset research groups interestingly it was revealed as regards the Value of Elective Induction over Selective Induction that the rate of elevation = 36.4%, efficacy =65.6%, relative rate =1.66, number needed to treat =2.7. **Conclusions:** The current study have revealed that the cesarean section deliveries are more statistically significantly higher among patients of selective induction whereas elective and spontaneous groups didn't show any difference denoting that elective induction is a mode of management that doesn't raise the rates of cesarean section besides it was observed to be safe as regards the maternal and neonatal clinical outcomes.

Key words: Induction Labor, Normal pregnant Multiparous, expectant Management

Introduction

The continuation of a woman's pregnancy requires that her cervix remains closed, rigid and that her uterus quiet and not contracting. Both of these conditions need to be reversed to initiate labor. The ways in which this is achieved are unknown but there is evidence that suggests the fetus itself plays an integral part. A woman's cervix, which contain little smooth muscle and is predominantly connective tissue with collagen as its main component, must undergo a process called ripening, where it becomes soft and pliable. This allows its shape to change from being long and closed to being thinned (effaced) and opening (dilating) ***(Adams and Griffin, 2017).***

Induction of labor is a common intervention in obstetric practice, which is a procedure used to stimulate uterine contractions during pregnancy to accomplish delivery prior to the onset of spontaneous labor ***(Aduloju and Akintayo, 2017).***

Laughon et al. (2012) demonstrated that over 40% of primiparous women, and over 30% of multiparous women, undergo labor induction.

The portion of pregnancies undergoing induction varies widely between countries, but it is estimated that approximately 20% of labors in the UK and USA are induced ***(Calder et al., 2008).***

Successful labor induction leads to a vaginal birth. A health care provider might recommend labor induction for various reasons, primarily when there's concern for a mother's health or a baby's health. Labor induction carries various risks, including infection and the need for a Cesarean section. Sometimes the benefits of labor induction outweigh the risks ***(ACOG, 2013).***

According to the American College of Obstetricians and Gynecologists (ACOG), labor should be induced only when it is riskier for the baby to remain inside the mother's uterus than to be born ***(Duro Gomez et al., 2016).***

Cervical status is a good predictor of the likelihood of vaginal delivery when labor is induced. Any induction method is likely to be effective in a woman with a favorable cervix, whereas no method is highly successful when performed in a woman with a cervix that is unfavorable (i.e., firm, posterior, and neither dilated nor effaced). Therefore, if the cervix is unfavorable, a ripening process is generally employed prior to induction ***(Duro Gomez et al., 2016).***

Cervical ripening is a complex process that results in physical softening and distensibility of the cervix, ultimately leading to partial cervical effacement and dilatation. Remodeling of the cervix involves enzymatic dissolution of collagen fibrils, increase in water content, and chemical

changes. These changes are induced by hormones (estrogen, progesterone, relaxin), as well as cytokines, prostaglandins, and nitric oxide synthesis enzymes. The two major techniques for iatrogenic cervical ripening are (1) mechanical (physical) interventions, such as insertion of catheters or cervical dilators, and (2) application of cervical ripening agents, such as prostaglandins ***(Ezebialu et al., 2015).***

Common indications for induction of labor are post-term pregnancy, hypertensive disorders, prelabor rupture of membranes, diabetes in pregnancy, suspected intrauterine growth retardation, macrosomia. Moreover, the rate of elective inductions i.e. induction without a medical indication, is rising rapidly. Reasons for wanting elective induction at term might include a women's physical discomfort, convenience of providers, or concern about the rapid progression of labor away from the hospital. Some clinicians may recommend elective induction due to concern about future complications ***(Boulvian, 2008).***

Methods for labor induction include both mechanical and pharmacological options. Pharmacological interventions to ripen the cervix as part of labor induction include administration of oxytocin, and prostaglandins delivered orally or vaginally. However, when induction of labor is attempted for a woman with an unfavorable cervix, other interventions used to assist the induction process, such as oxytocin or rupture of

membranes, are connected with reduced effectiveness and high failure rates ***(Aduloju et al., 2016).***

Prostaglandins are frequently used for labor induction in pregnant women. The presence of cervical immaturity indicates the use of prostaglandin compounds, frequently followed by oxytocin infusion, prostaglandins are received orally or applied locally to the cervix or the vagina, to promote both cervical ripening and myometrial contractility ***(Sifakis et al., 2007).***

Various prostaglandins preparations including misoprostol vaginal tablets, dinoprostone vaginal gel and vaginal insert are commercially available to be used in labor induction. Misoprostol is a synthetic prostaglandin El analogue and has been reported to be a considerably safe and efficacious cervical ripener. It's inexpensive, easy to administer, stable at room temperature, does not require refrigeration. It acts as an effective myometrial stimulant of the pregnant uterus, selectively binding to EP-2/EP-3 prostaglandin receptors ***(Toppozada, 1994).***

AIM OF THE WORK

The aim of present study is to compare the outcomes of elective induction of labor at 39 weeks in Multiparous women to expectant management.

1. Research Question:

In normal pregnant multiparous women at 39 weeks gestation, does elective induction of labor have similar rate of cesarean section (CS) to expectant management at term?

2. Research Hypothesis:

Elective induction of labor in normal pregnant multiparous women at 39 weeks gestation have the same rate of cesarean section as expectant management.