Relation Of The Length Of First Stage Of Labor To Mode Of Delivery, Maternal And Neonatal Complications In Women Undergoing Induction Of Labor

Thesis

Submitted for Partial Fulfillment
of Master Degree in Obstetrics and Gynecology

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✍ *To*

Family *for their warm affection, patience, encouragement, and for always being there when I needed them*

✍ *To*

My Wife *who always support me*

My kids *who fill my life with joy*

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Introduction

Induction of labor is the artificial initiation of labor before its spontaneous onset for the purpose of delivery of the fetoplacental unit. **(Crane, 2001)**

From 1983 through 1996, induction rates worldwide ranged between 7.5% and 26%, with trends of increasing rates in the most recent years.**(Maslow and Sweeny ,2000)**

Currently, about one in five pregnant women undergo labor induction, with the highest rates of induction occurring in women with the longest gestations (25% of women who reach 41 weeks). **(Alexander et al., 2001)**

Induction of labor that is not indicated for a medical reason, also termed elective induction of labor, appears to be rising as well and at a rate even more rapidly than that of the overall induction of labor.**(Caughey et al., 2009)**

Induction may be advocated to reduce fetal or neonatal morbidity and mortality as with post-term pregnancy, oligohydramnios, and suspected intrauterine growth restriction (IUGR), to minimize maternal morbidity, as with maternal cardiac disease and pre-eclampsia and eclampsia, or to benefit both mother and fetus as with prelabor rupture of membranes (PROM) at term and fetal macrosomia.**(Mozurkewich et al., 2009)**

Potential risks of induction include increased rate of operative vaginal delivery, Caesarean birth, excessive uterine activity, abnormal fetal heart rate patterns, uterine rupture, maternal water intoxication, delivery of preterm infant due to incorrect estimation of dates, and

possibly cord prolapse with artificial rupture of membranes. **(Kelly et al.,2001)**

The contraindications to induction of labor include contraindications to labor or vaginal delivery. Examples of this include previous myomectomy entering the uterine cavity, previous uterine rupture, fetal transverse lie, placenta previa, vasa previa, invasive cervical cancer, active genital herpes, and previous classical or inverted T uterine incision (except in unusual circumstances such as extreme prematurity). **(Crane, 2001)**

In the absence of a ripe or favorable cervix, a successful vaginal birth is less likely. Therefore, cervical ripening or preparedness for induction should be assessed before a regimen is selected. Assessment is accomplished by calculating a Bishop score. When the Bishop score is less than 6, it is recommended that a cervical ripening agent be used before labor induction. Non pharmacologic approaches to cervical ripening and labor induction have included herbal compounds, castor oil, hot baths, enemas, sexual intercourse, breast stimulation, acupuncture, acupressure, transcutaneous nerve stimulation, and mechanical and surgical modalities. Of these non pharmacologic methods, only the mechanical and surgical methods have proven efficacy for cervical ripening or induction of labor. 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. **(Tenore ,2003)**

Many studies have reported an association between induction of labor and cesarean delivery, both for medically indicated and elective inductions, as well as in low-risk populations**.(Vahratian et al.,2005)**

Although studies on induction often focus on methods and efficacy of different induction agents, little data exist regarding the duration of labor.

Induction and associated outcomes. One recent study examined factors associated with the length of the latent phase during labor induction and reported that only the modified Bishop score at admission is associated with the length of latent labor; however, the association between perinatal outcome and duration of induction remains largely unexplored**.(Grobman and Simon, 2006)**

In women who underwent induction of labor, even when a second stage of labor was reached, the risk for cesarean delivery and maternal morbidity remained increased when the length of the first stage was longer than 24 hours. However, in this clinical scenario, the frequency of cesarean delivery remains less than 50%. The decision for surgical intervention thus should not be based on the elapse of time alone**.(Cheng et al., 2009)**

Aim of the work

The aim of this study is to estimate the relation between the length of first stage of labor and mode of delivery, maternal and neonatal complications in women undergoing induction of labor.

Patients and methods

This is a prospective study which will be conducted at Ain Shams Maternity Hospital in the period from December 2010 to May 2011. The study will include a total number of 100 case from patients who attending the labor word in the previous hospital for induction of labor.

Statistical methods:

Based on 6.4% of cesarean deliveries among cases with short first stage & 34.9% of cesarean deliveries among cases with long first stage of labor, Alpha error 5% &power of study 90%: the required sample size is 100 case. State 10 is the program used for sample size calculation

All women in this study should fulfill the following criteria:

A- Inclusion criteria:

1. Age: 18-40 years.
2. Parity: primigravida and multigravida with previous normal vaginal delivery will be included.
3. Pregnant women with single living fetus with normal presentation (cephalic)
4. Gestational age 39 weeks or more.
5. Intact uterus with no previous cesarean section or previous myomectomy.
6. Capacious pelvis with no cephalopelvic disproportion.
7. Pregnant women with intact membrane and with no history of vaginal bleeding.

B- Exclusion criteria:

1. Presence of medical disorder as: diabetes mellitus, hypertension.
2. Absolute obstetric contraindication for normal vaginal delivery as transverse lie, contracted pelvis and placenta previa.
3. Evidence of starting labor either by cervical changes or regular uterine contractions.
4. Presence of oversize fetus, multiple pregnancies, noncephalic presentation , intrauterine growth retardation or known lethal congenital anomalies.
5. Fetal distress detected by CTG or Doppler US.
6. delivery before 37 weeks' gestation.
7. cesarean delivery during the first stage of labor.

Every women in the study will be subjected to the following:

1. .Every women will share in the study should be discussed about the study and oral consent should be taken.
2. Complete history taking to detect inclusion and exclusion criteria including:
3. Personal history (name, age address, special habits of medical importance).
4. Family history of diabetes mellitus, hypertension, over sized baby and twins pregnancy.
5. Past history of surgical operation as myomectomy or caesarean section.
6. Obstetric history as regard previous instrumental delivery or fetal trauma, post partum complications.
7. Menstrual history: to detect the date of last menstrual period and gestational age.

8. History of evidence of labor or rupture of membrane.

Examination:

1. General examination (pulse - blood pressure – temperature – respiratory rate and edema of the lower limbs).
2. Abdominal examination to (fundal level – fundal grip – umbilical grip – first and second pelvic grip) to determine fetal macrosomia and engagement of the fetal head, detection of fetal heart rate.
3. Pelvic examination: PV to determine the cervical state (cervical length – effacement – dilatation – intact membrane – presenting part – any abnormal vaginal secretions as blood and liquor), pelvic capacity, station.

Investigation:

- Ultrasound to detect:
  - Gestational age
  - Oligohydramnios
  - Placenta previa
  - Intrauterine growth retardation
  - Oversized baby
  - Placental calcification
- CTG (cardiotochography): for detection of fetal distress.

➢ **<u>Induction of labor</u>:-**

The mode of induction will be choosed according to Bishop score; if Bishop score < 6, Prostaglandin will be used &if > 6 Oxytocin will be used according to the institutional protocol performed at Ain Shams Maternity Hospital, then the following data will be collected:-

- *Length of first stage of labor (*Which is the time from onset of painful, regular contractions, occurring every 5 minutes or at least 3 contractions in a 10- minute period , in the presence of cervical change till complete cervical dilation).

❖ Entire duration of first stage include both latent and active phases of labor, we will not include the time interval for initiating labor induction to the start of the first stage.

- **Primary outcome:-**
  - *Mode of delivery*: spontaneous vaginal delivery (SVD), operative vaginal delivery (including both vacuum-assisted vaginal delivery and forceps delivery), or cesarean delivery.
  - *Maternal outcomes include*:- incidence of third- or fourth-degree perineal laceration, postpartum hemorrhage (PPH, defined as estimated blood loss >500 mL after vaginal delivery or >1000 mL after cesarean delivery), chorioamnionitis, and endomyometritis.
  - *Neonatal outcomes include* :-5-minute Apgar score <7, umbilical artery (UA) pH <7.0, umbilical artery base deficit > -12 mmol/L, shoulder dystocia, birth trauma (a composite variable for brachial plexus injury, facial nerve palsy, clavicular fracture, skull fracture, and head lacerations as diagnosed by the attending pediatrician caring for the neonates) and rates of admission to the neonatal intensive care nursery (NICU) as well as a composite variable.

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