Bishop Score versus Fetal Fibronectin in Predicting Successful Induction of labor

Thesis

Submitted for partial fulfillment of the master degree of
In Obstetrics & Gynecology

By

Ahmed Mohamed Swidan
M.B.B.Ch- Misr university for science and technology, 2009
Visitor Resident of Obstetrics and Gynecology
Faculty of Medicine, Ain Shams University

Supervised by

Prof. Mourad Mohey El-Din El-Said
Professor of Obstetrics and Gynecology
Faculty of Medicine, Ain Shams University

Assist. Prof. Ihab Fouad Serag Eldin Allam
Assistant professor of Obstetrics and Gynecology
Faculty of Medicine, Ain Shams University

Dr. Mostafa Fouad Gomaa
Lecturer of Obstetrics and Gynecology
Faculty of Medicine, Ain shams University

Faculty of Medicine
Ain Shams University
2013


بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا
عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ
صدق الله العظيم
سورة البقرة آية (32)

Acknowledgement

First of all, all gratitude is due to **God** *almighty for blessing this work, until it has reached its end, as a part of his generous help, throughout my life.*

Really I can hardly find the words to ex, my gratitude to **Prof. Mourad Mohey El-Din El-Said** *Professor of Obstetrics and Gynecology, faculty of medicine, Ain Shams University, for his supervision, continuous help, encouragement throughout this work and tremendous effort he has done in the meticulous revision of the whole work. It is a great honor to work under his guidance and supervision.*

I would like also to ex, my sincere appreciation and gratitude to **Assist. Prof. Ihab Fouad Serag Eldin Allam** *Assistant professor of Obstetrics and Gynecology, faculty of medicine, Ain Shams University, for his continuous directions and support throughout the whole work.*

Last but not the least, a very special thanks goes out to **Dr. Mostafa Fouad Gomaa** *Lecturer of Obstetrics and Gynecology, for his systematic guidance and great effort during the course of this thesis.*

To my **colleagues**, *my* **patients** *and to everyone who participated in one way or another in this work, I owe my thanks and appreciation*

Last but not least, I dedicate this work to my **family**, *whom pushed me forward to accomplish this work.*

Ahmed Mohamed Swidan

Contents

List of Abbreviations

C.I.	:	Confidence interval
FFN	:	Fetal fibronectin
IQR	:	Inter-quartile range
PGE2	:	Prostaglandin E2
r	:	Spearman's correlation
SE	:	Standard error
Z	:	Mann Whitney test, $\chi 2$: Chi Square test
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β	:	Regression coefficient

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Introduction

Labor induction is the stimulation of regular uterine contractions before the spontaneous onset of labor using mechanical or pharmacologic methods in order to generate progressive cervical dilatation and subsequent delivery ***(Martin et al.,2009).***

Induction of labor is one of the most common procedures in obstetrics. The rate of labor induction increased from 9.5% of all labors in 1990 to 20.6% in 2003 due to use of labor induction for post-term pregnancies and an increasing trend toward elective induction of labor ***(Martin et al.,2005).***

Labor induction is indicated when the benefits of delivery to the mother or fetus outweigh the potential risks of continuing the pregnancy. The most appropriate timing for labor induction is the point at which the maternal or perinatal benefits are greater if the pregnancy is interrupted than if the pregnancy is continued ***(Washington et al.,1996).***

Ideally, most pregnancies should be allowed to reach term, with the onset of spontaneous labor being the sign of physiologic termination of pregnancy***(Washington et al.,1996)***.

Cervical examination is widely used during pregnancy because clinical decisions are taken according to this evaluation to choose the type of induction (oxytocin versus prostaglandins). The state of the cervix can be ex,ed as a score summarizing several characteristics of the cervix. The first attempts to quantify cervical ripeness by a score were reported in 1931***(Fuentes et al.,1995)***.

In 1964, Bishop described a cervical score in order to select women with a favorable cervix for labor induction. Women included in the study were multiparous, over 36 weeks

of gestation and with a fetus in cephalic presentation. This score is based on five clinical items: dilation, effacement, head station, consistency and cervical position ***(Bishop,1964)***.

For each item, 0-3 points are given, the sum of these points corresponding to the score. The score was later modified by Burnett. The value of the Bishop score is to predict the success of labor induction. A higher score is associated with reduced labor duration and a higher likelihood of successful induction. ***(Burnett,1966)***.

Because the assessment of the cervix is an extremely subjective judgment, results tend to vary to a considerable degree. Particularly in the case of multiparous women, the reliability of the Bishop score is furthermore reduced by the fact that the cervix may be shortened and opened days or even weeks before the date of labor***(Husslein,1991)***.

Fetal fibronectin is a special form of glycoprotein. By use of the monoclonal antibody FDC-6, it has become possible to identify minor structural differences, permitting the differentiation between fetal and adult fibronectin. ***(Lockwood et al.,1991).***

Amniotic fluid contains a high concentration of fetal fibronectin, and it can also be found in the amnion and in the area between decidua parietalis and chorion. When the date of labor is imminent, fibronectin enters into cervical and vaginal secretions, a process thought to be set off by the noticeable increase in light contractions and the resulting movement of chorion against the decidual layer of the uterus so that the presence of fetal fibronectin in cervicovaginal secretions at the end of the pregnancy is an indicator of imminent birth***(Ahner et al.,1995)***

Aim of the Work

To compare efficacy of the use of fetal versus bishop score in prediction successful induction of labor in patients at term.

-**Hypothesis:**

Fetal fibronectin can be used in assessment of patients before induction of labor.

- Research question:

Will fetal fibronectin help in prediction of outcome of induction of labor?

-Primary outcome:

Duration of induction and delivery.

- Secondary outcome:

Maternal and neonatal morbidity and mortality.

Induction of Labor

Induction of labor is an important and common clinical procedure in obstetrics, the rate of labor induction in the United States continues to rise. Data for the year 2006 from the national center for health statistics indicated that the rate was 22.5% for that year with a slight increase over 2005 and double the rate for 1990 the reason for this increase is unclear, also it may be partly reflect a growing use of labor induction foe postdate pregnancies and an increase trend toward elective induction of labor **(Martin et al., 2009).**

Indications and contraindications:

Labor induction is indicated when the benefits of delivery to the mother or fetus outweigh the potential risks of continuing the pregnancy. The most appropriate timing for labor induction is the point at which the maternal or prenatal benefits are greater if the pregnancy is interrupted than if the pregnancy is continued **(Gonen et al.,1998).**

Commonly accepted indications for labor induction are:

- Pregnancy induced hypertension
- Prelabor rupture of membranes
- Chorioamnionitis

- Intrauterine growth restriction.
- Maternal medical problems (diabetes mellitus).
- Postdates pregnancy.
- Oligohydramnios.

Contraindications to labor induction:

- Placenta or vasa previa.
- Transverse fetal lie.
- Prolapsed umbilical cord.
- Prior uterine incision.
- Active genital herpes infection.
- Pelvic structural deformities.
- Fetal distress.
- Moderate ante partum hemorrhage.

Cautions in Labor Induction:

☐ Grand multiparty (greater than four)

☐ Vertex not fixed in the pelvis

☐ Unfavorable or unripe cervix

☐ Brow or face presentation

☐ Over distension of uterus (polyhydramnios or multifetal pregnancy)

☐ Lower segment uterine scar (extreme caution)

☐ Pre-existing hypertonus

☐ Prior history of difficult labor and/or traumatic delivery

(RCOG, 2008).

Induction of labor versus expectant management

One systematic review (19 RCTs, 7984 women) assessed the effectiveness and safety of induction of labor in reducing the risks associated with pregnancy at and beyond term. This review reported that a policy of induction of labor at 41 completed weeks (41+0) or beyond was associated with fewer (all-cause) perinatal deaths when compared with expectant management Excluding death due to congenital abnormality (*n* = 3,one in the induction group and two in the expectant management group), there were no deaths in the induction group versus seven deaths in the no induction group **(Helmer, 2006)**

The causes for the perinatal deaths in the expectant management groups were meconium aspiration (four), intrauterine death at 292 days of gestation (one), stillbirth with abnormal maternal glucose tolerance test (one) and neonatal pneumonia (one). In the group induced at 41 completed weeks of gestation, the number of perinatal deaths in the group was 0/2835 compared with 6/2808 in the expectant management group **(Gulmezoglu et al.,2006).**

Acceptability of induction of labor to women:

Acceptability of induction of labor was evaluated in a UK questionnaire survey of 500 pregnantwomen at 37 weeks

of gestation who were considered suitable for the potential conservative management of prolonged pregnancy. Initially, 45% of women thought that they would agree toexpectant management, but this changed with advancing gestational age irrespective of parity and uncertainty in gestational age (45% at 37 weeks versus 31% at 41 weeks, $P<0.05$) **(Cox 1995)**.

The main reasons given included 'could not stand the thought of being pregnant for more than 42 weeks', 'no benefit in waiting', 'no risk involved in having labor induced', 'concern regarding fetal size' and 'no member of the family available after 42 weeks of gestation **(Roberts et al.,1991).**

The NICE antenatal care guideline provides guidance relating to monitoring of women who decline induction beyond 42 weeks **(RCOG, 2008).**

Assessment*:*

For induction of labor to be considered and to be offered, there must be evidence that such an intervention carries benefits for the mother and/or her baby and this requires careful consideration of the clinical evidence in discussion with the woman **(Heimstad et al.,2007).**

The interests of the mother may occasionally run counter to those of the baby and vice versa, so that consideration of the offer of induction of labor requires a

careful weighing up of the evidence and sensitive discussion of the issues with the mother **(Balchin et al.,2007)**.

In all cases, there is a clear need for the provision of information to allow women being considered for induction of labor to make a fully informed choice. It is also imperative that the most accurate information is obtained concerning the gestational age of the pregnancy. In most instances, there will be reliable menstrual data supported by evidence from an ultrasound examination made in the early weeks of pregnancy and, indeed, nowadays the information from the latter source will take precedence from the clinician's perspective even though many women are clear about their own due dates **(Heimstad et al.,2006)**.

Where evidence from these sources is lacking and the gestational age is in doubt, extra care should be taken in assessing the balance of risks. If, after discussion of the relevant issues, the woman chooses to decline the offer of induction of labor, she must not be made to feel alienated from her healthcare professionals and further discussion is required regarding the measures needed for ongoing monitoring of the pregnancy. It is also important to inform the woman that induction of labor is not always successful and she should be