Role of Sonographic Cervical Length and Modified Bishop Score in Preinduction Cervical Assessment: A Randomized Controlled Trial

Thesis

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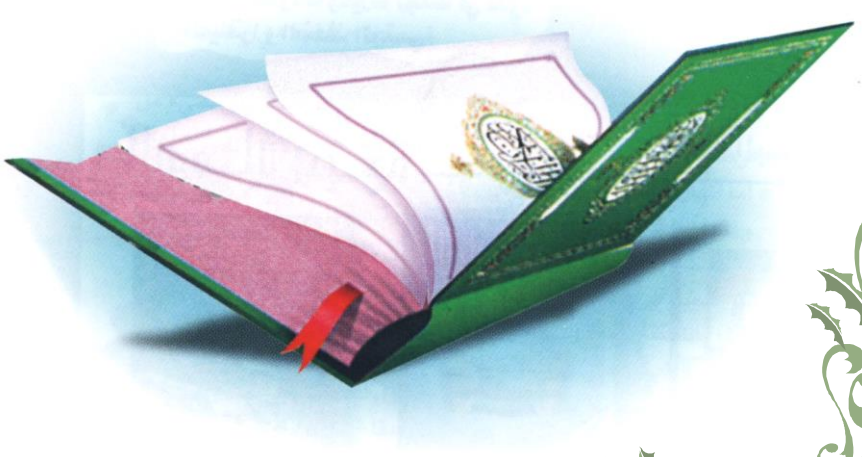
بسم الله الرحمن الرحيم

" رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ الَّتِي أَنْعَمْتَ عَلَيَّ وَعَلَى وَالِدَيَّ وَأَنْ أَعْمَلَ صَالِحًا تَرْضَاهُ وَأَدْخِلْنِي بِرَحْمَتِكَ فِي عِبَادِكَ الصَّالِحِينَ "

صدق الله العظيم

النمل {١٩}



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List of Abbreviation

ACOG	American College of Obstetric and Gynecology
ARM	Artificial Rupture of Membranes
BMI	Body mass index
CS	Cesarean section
CL	Cervical length
CRF	Corticotropin-releasing factor
2D	Two-dimensional
EDC	Estimated date of confinement
fFN	Fetal fibronectin
FHR	Fetal heart rate
HPA	Hypothalamic-pituitary-adrenal
IL-8	Interleukin-8
MMP	Metalloprotienases
PGDH	Prostaglandin dehydrogenase enzyme
PGE2	Prostaglandin E2
PGF2a	Prostaglandin F2a
RCT	Randomized controlled trial

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INTRODUCTION

Introduction

Induction of labor represents one of the most common interventions in clinical obstetrics. In recent years, the rate at which providers choose to induce labor has more than doubled, from a rate of 9.5% of all labors induced in 1991 to a rate of 20.6%in 2003 ***(Martin et al., 2005).***

One of the challenges of labor induction is predicting which patients will have success. This is especially true in cases of elective induction which have been estimated to account for up to 25% of all inductions ***(Glantz et al., 2003).*** Failed induction appears to be one factor that is responsible for the increasing cesarean delivery rate ***(Luthy et al., 2004).***

Labor induction, whether medically indicated or elective, is associated with an increased risk of cesarean delivery compared with spontaneous labor, and this risk is significantly influenced by the status of the cervix at the time of labor induction particularly in nulliparous women and although cervical assessment with the use of the Bishop score was described initially in its application to multiparous women, it has also been shown to predict

induction success in nulliparous women ***(Seyb et al., 1999; Vrouenraets et al., 2005).***

Preinduction cervical length plays a key role in labor progression during the latent phase, but not during the active phase of labor. Cervical status has been established to be clearly related to the outcome and success of labor induction ***(Bishop, 1964).***

Investigators have used the likelihood of vaginal delivery or the time interval between induction and delivery as primary outcome variables. However, the use of these parameters as outcome variables obviously affects conclusions because they are influenced by factors other than cervical status, for example, by parity, birth weight maternal stature, and indications for cesarean delivery ***(Cnattingius et al., 2005; Rane et al., 2003).***

The delivery mode and total duration of labor can be affected by many various factors other than cervical status, for example, parity, fetal size and position, maternal stature, indications for cesarean delivery, induction agents, and physician preference. In fact, parity was an independent predictor of the total duration of labor as well as the duration of induction, and neither cervical length nor the Bishop score was significantly predictive

for the total duration of labor. In addition, there was no difference in delivery mode between women with short and long cervical lengths ***(Ware et al., 2000; Gabriel et al., 2002).***

Cervical assessment before labor induction is essential to select candidates for elective induction and to determine the most appropriate method for inducing labor or ripening an unfavorable cervix. The sonographic measurement of cervical length probably has several advantages over digital estimation. Ultrasound imaging can assess full cervical length and status of the internal os without invading the endocervical canal ***(Lenihan, 1984).***

Although the Modified Bishop score remains recognized as a useful tool, some care givers have voiced concerns about its accuracy. The ultrasonographic measurement of cervical length is more accurate and reliable than digital examination. In addition, ultrasonographic cervical assessment has been known as a reproducible, objective, and quantitative method, and can be performed easily. Therefore, more liberal application of ultrasonography to preinduction cervical assessment in term pregnancy would enable obstetricians to predict the outcome of labor induction and to select a safer and more

efficient policy of induction ***(Goldberg et al., 1997; Sonek et al., 1998).***

Recently several investigators have demonstrated that transvaginal sonographic measurements of the cervical length are a better predictor of successful labor induction outcome than the Bishop score ***(Rane et al., 2004).***

Women with long cervical lengths at the time of induction may experience a longer latent phase. On the contrary, if women, whose cervices have been short and started to dilate, begin labor by induction, not much time will elapse to enter the active phase of labor ***(Feinstein et al., 2002).***

Several authors have suggested that an ultrasound examination can offer a more accurate assessment of the cervical length and wedging than can digital examination ***(Pandis et al., 2001; Ware et al., 2000).***

In comparison of Transvaginal ultrasonography with the Bishop score, the use of sonographically measured cervical length for assessing the cervix prior to the induction of labor can reduce the need for prostaglandin administration by approximately 50%

without adversely affecting the outcome of induction in nulliparae at term ***(Bartha et al., 2005).***

The use of sonographically measured cervical length with a cut-off value of ≥28 mm is as effective as the Modified Bishop score with a cut-off value of ≤4 for determining prostaglandin administration for preinduction cervical ripening in nulliparae at term requiring induction. Indeed, these observations were expected, given that the favorability of the cervix prior to induction of labor has a substantial impact on outcome **(*Sanchez-Ramos, 2005; Xenakis et al., 1997).***

The incidence of Cesarean section following labor induction when the cervix is unfavorable has been reported to be between 22% and 24% for High-risk pregnancies, such as those involving prolonged gestation, pre-eclampsia or fetal growth restriction, are usually candidates a prompt delivery. Induce labor should be made with caution; it would be useful to be able to predict induction failure and thus determine whether it would be better to carry out a Cesarean section. Transvaginal ultrasound assessment of the cervix has been reported to be a simple and reproducible examination for the prediction of successful labor induction ***(Pandis et al., 2001).***