Dexamethasone Effect on Induction-delivery Interval at Term Randomized Controlled Trial

Thesis

*Submitted for Partial Fulfillment of Master Degree in **Obstetrics and Gynecology***

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Samar Sayed EL-Sayed

Contents

List of Abbreviations

11β-HSD	**:**	11β-hydroxysteroid dehydrogenase
AC	**:**	Abdominal circumference
ACTH	**:**	Adrenocorticotropic hormone
ADD	**:**	Actual day of delivery
AFI	**:**	Amniotic fluid index
AP	**:**	Activating protein
BMI	**:**	Body mass index
BP	**:**	Blood pressure
BPM	**:**	Beats per minute
bpm	**:**	Beat per minute
BPP	**:**	Biophysical profile
CL	**:**	Cervical Length
COX2	**:**	Cyclo-oxygenase-2
CRH	**:**	Corticotropin releasing hormone
CRH-R	**:**	CRH receptors
CRH-R1	**:**	CRH receptor type 1
CRH-R2	**:**	CRH receptor type 2
CSF	**:**	Colony stimulating factor
CTG	**:**	Cardiotocography
CYP l7	**:**	17alpha-hydroxylase/17, 20-lyase
D	**:**	Dexamethasone
DCs	**:**	Dendritic cells
DHEA	**:**	Dehydroepiandrosterone sulfate –S
EASI	**:**	Extra-Amniotic Saline Infusion
EFW	**:**	Estimated fetal weight
FGR	**:**	Fetal growth restriction

FH	**:**	Fundal height measurement
GR	**:**	Glucocorticoid receptors
GRE	**:**	Glucocorticoid responsive elements
HFA	**:**	Human fetal adrenal
HPA	**:**	Hypothalamic-pituitary-adrenal
HSD3B2	**:**	3-hydroxysteroid dehydrogenase type II
IL-1b	**:**	Interleukin-1b
IL-8	**:**	Interleukin-8
iNOS	**:**	Inducible nitric oxide synthase
IOL	**:**	Induction of labor
IUFD	**:**	Intrauterine Fetal Demise
IUGR	**:**	Intrauterine Growth Restriction
LMP	**:**	Last Menstrual Period
MAS	**:**	Meconium aspiration syndrome
MCSF	**:**	Macrophage stimulating factor
MMP	**:**	Metalloproteinase
mRNAs	**:**	Messenger RNAS
MSL	**:**	Meconium stained liquor
N.S.	**:**	Non-significant
NFκB	**:**	Nuclear factor κB
NICE	**:**	Institute for Health and Care Excellence
NKT	**:**	Natural killer T
NO	**:**	Nitric oxide
NST	**:**	Non-stress test
P	**:**	Placebo
PE	**:**	Pre-eclampsia
PGDH	**:**	Prostaglandin dehydrogenase

PGE_1	**:**	Prostaglandin E_1
PGE_2	**:**	Prostaglandin E_2
PGs	**:**	Prostaglandins
PIH	**:**	Pregnancy-Induced Hypertension
PR	**:**	Progesterone receptor
PRs	**:**	Progesterone receptors
RCTs	**:**	Randomized controlled trials
ROM	**:**	Rupture of membranes
RU486	**:**	Roussel Uclaf drug number 486
SGA	**:**	Small for gestational age
siRNA	**:**	Small interfering RNA
SP-A	**:**	Surfactant protein-A
TNF	**:**	Tumor necrosis factor
TVU	**:**	Trans-vaginal Ultrasound
US	**:**	Ultrasonographic

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Protocol of Thesis

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Introduction

Induction of labor refers to the process of artificially initiating uterine contractions prior to their spontaneous onset to effects progressive effacement and dilatation of the cervix and ultimately, delivery of the baby ***(Hayman, 2010).***

It is one of the most commonly performed obstetrical procedures in In the United States, the incidence of labor induction more than doubled from 9.5 percent in 1991 to 23.2 percent in 2011 ***(Martin, 2013).***

Reasons for the increase in these inductions include the availability of better cervical ripening agents, patient and provider desire to arrange a convenient time of delivery, and more relaxed attitudes toward marginal indications for induction ***(Rayburn et al., 2002).***

Delivery before the onset of labor is indicated when the maternal/fetal risks associated with continuing the pregnancy are thought to be greater than the maternal/fetal risks associated with early delivery ***(ACOG,2009).***

The success of induction and labor progression is dependent on the condition of the cervix before induction initiation ***(Barclay, 2009).***

About 10 percent of pregnancies may be prolonged. In general, the longer the truly post-term fetus stays in the uterus, the greater the risk of a severely compromised fetus and newborn infant. Therefore of major importance in handling compromised postdate pregnancies is the use of a suitable method of labor induction ***(Petraglia et al., 2010).***

A prolonged gestation is more likely to occur when the fetus has congenital adrenal hyperplasia caused by 2l-hydroxylase deficiency, which may be due to an impaired cortisol production ***(O'Sullivan et al., 2007).***

Glucocorticoids are now known to play key roles in fetal maturation for example in maturation of the lung in anticipation of extra-uterine life and in several species appear to be mediators in the initiation of labor ***(Falah et al., 2014).***

The process of childbirth starts from the axis of the hypothalamus, the pituitary gland, and the adrenal glands. Steroid substances produced in the adrenal glands of the human fetus affect the placenta and the membranes and

transform the myometrium from the static to the contractile state ***(Hoffman et al., 2012)***.

The placenta may play a role in this process because it produces a lot of Corticotropin releasing hormone (CRH). The adrenal glands of the fetus do not produce a considerable amount of cortisol until the third trimester. During the last weeks of pregnancy, the cortisol and Dehydroepiandrosterone sulfate (DHEA –S) contents of the fetus rise and this leads to an increase in maternal estrogens, a particularly sterol ***(Hoffman et al.,2012).***

Placental CRH is not under the influence of negative feedback from cortisol. The concentration of CRH in the fetus rises during the last 12 weeks of pregnancy. This results in modification of the contractility of the uterus {1**},** stimulation of the membranes to produce more prostaglandins{2},stimulation to produce C19 steroids from placental adrenaline {3}, and increase in the estrogen content {4}.This will disturb the ratio of estrogen to progesterone and will cause expression of contractile proteins. In fact, the increase in CRH near the end of pregnancy confirms the presence of a placental-fetal clock ***(Hoffman et al., 2012).***