

**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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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

لَسْبَدَّانِكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

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List of Abbreviations

| | |
|---------------------------------|--|
| 11β-HSD | : 11 β -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 17 | : 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 |

| | |
|------------------------|----------------------------------|
| PGE₁ | : Prostaglandin E ₁ |
| PGE₂ | : 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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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 21-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*).