

**Effect of Intramuscular Administration  
of Dexamethasone on Shortening of  
the Duration of Induction of Labor  
by oxytocin**

Thesis

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

By

**Medhat Ramadan Badawy**

*M.B., B.Ch*

*Cairo University (2008)*

*Resident in Mubarak Central Hospital*

Under Supervision of

**Dr. Tarek Aly Raafat**

*Assistant Professor of Obstetrics and Gynaecology*

*Faculty of Medicine, Ain Shams University*

**Dr. Kamal Ahmed Eldessouki**

*Lecturer of Obstetrics and Gynaecology*

*Faculty of Medicine, Ain Shams University*

**Faculty of Medicine**

**Ain Shams University**

**2017**



# Acknowledgment

First thanks to Allah to whom I relate any success in achieving any work in my life.

I wish to express my deepest thanks and gratitude to Dr. Tarek Aly Raafat Assistant Professor of Obstetrics and Gynaecology for his supervision, kind guidance, valuable instructions and generous help.

Special thanks are due to Dr. Kamal Ahmed Eldessouki Lecturer of Obstetrics and Gynaecology for his sincere efforts and fruitful encouragement.

✍ *Medhat Ramadan*



---

# Contents

Subjects	Page
• List of Abbreviations.....	I
• List of Tables.....	IV
• List of Figures.....	VI
• Abstract .....	VIII
• Introduction.....	1
• Aim of the study .....	4
• Review of Literature	
- <b>Chapter I:</b> Parturition.....	5
- <b>Chapter II:</b> Induction of Labor.....	34
- <b>Chapter III:</b> Postdate.....	52
- <b>Chapter IV:</b> Glucocorticoids and Human Parturition.....	58
• Subjects & Methods.....	74
• Results .....	84
• Discussion.....	102
• Summary & Conclusion.....	108
• Recommendations.....	110
• References .....	111
• Arabic summary	

---

## List of Abbreviations

<b>11B-HSD1</b>	:	11B-Hydroxy steroid dehydrogenase type1
<b>ACOG</b>	:	American College of Obstetricians and Gynecologists
<b>ACTH</b>	:	Adrenocorticotrophic hormone
<b>AFI</b>	:	Amniotic fluid index
<b>ATP</b>	:	Adenosine triphosphate
<b>BMI</b>	:	Body mass index
<b>BP</b>	:	Blood pressure
<b>BPM</b>	:	Beats per minute
<b>BPP</b>	:	Biophysical profile
<b>C/S</b>	:	Cesarean Section
<b>C-AMP</b>	:	Cyclic adenosine monophosphate
<b>CC</b>	:	Cubic centimeters
<b>COX-2</b>	:	Cyclooxygenase 2
<b>CPLA2</b>	:	Cytosolic phospholipase A2
<b>CRH</b>	:	Corticotrophin Releasing Hormone
<b>CRH-BP</b>	:	CRH-binding protein
<b>CSF</b>	:	Colony-stimulating factor
<b>CST</b>	:	Contraction stress test

## List of Aberrations

---

<b>Cyclic AMP</b>	: Cyclic adenosine monophosphate
<b>CYP17-CYP11A</b>	: Cytochrome enzyme (p17-p11A)
<b>DHEAS</b>	: Dehydro epiandrosterone sulfate
<b>DZ</b>	: Definitive zone
<b>EASI</b>	: Extra-Amniotic Saline Infusion
<b>EDD</b>	: Expected delivery date
<b>EFM</b>	: Electronic fetal heart rate monitoring
<b>Eg</b>	: Example
<b>fFN</b>	: Fetal Fibronectin
<b>FHR</b>	: Fetal heart rate
<b>HFA</b>	: Human fetal adrenal
<b>HSD3B2</b>	: 3-hydroxysteroid dehydrogenase type II
<b>IGFBP-1</b>	: Insulin-Like Growth Factor Binding Protein-1
<b>IL-8</b>	: Interleukin-8
<b>LMP</b>	: Last menstrual period
<b>M2</b>	: Meters square
<b>M-CSF</b>	: Macrophage stimulating factor
<b>MMps</b>	: Metallo proteinases
<b>mRNA</b>	: Messenger Ribonucleic Acid

## List of Aberrations

---

<b>NA</b>	: Not applicable
<b>NO</b>	: Nitric oxide
<b>NST</b>	: Non stress test
<b>PGDH</b>	: 15-hydroxy prostaglandin dehydrogenase
<b>PGE2-</b> <b>PGF2</b>	: Prostaglandin
<b>PGHS</b>	: Prostaglandin endoperoxide H synthase enzyme
<b>PGHS-2</b>	: Prostaglandin synthesis
<b>PGs</b>	: Prostaglandins
<b>RCOG</b>	: Royal Colleague of Obstetrics and Gynecology
<b>SVD</b>	: Spontaneous vaginal delivery
<b>TNF</b>	: Tumor necrosis factor
<b>TZ</b>	: Transitional zone
<b>WHO</b>	: World Health Organization

## List of Tables

Table No.	Title	Page No.
<b>Table (1)</b>	Bishop Scoring System Used for Assessment of Inducibility	<b>19</b>
<b>Table (2)</b>	Traditional Definitions of Abnormal Labor	<b>28</b>
<b>Table (3)</b>	Factors that may affect fetal oxygenation in labor.	<b>57</b>
<b>Table (4)</b>	Duration of action for Glucocorticoid analogues	<b>61</b>
<b>Table (5)</b>	Statistical comparison between the two studied groups age, BMI and gestational age on admission date..	<b>84</b>
<b>Table (6)</b>	Statistical comparison between the two studied groups as regard pulse and blood pressure	<b>86</b>
<b>Table (7)</b>	Statistical comparison between the two studied groups as regard Bishop Score at time of intervention	<b>87</b>
<b>Table (8)</b>	Statistical comparison between the two studied groups as regard duration between adequate uterine contraction and active phase	<b>88</b>
<b>Table (9)</b>	Statistical comparison between the two studied groups as regards duration of active phase of labor	<b>90</b>

## List of Tables

---

<b>Table No.</b>	<b>Title</b>	<b>Page No.</b>
<b>Table (10)</b>	Statistical comparison between the two studied groups as regards rate of cervical dilatation	<b>92</b>
<b>Table (11)</b>	Statistical comparison between the two studied groups as regards duration of 2 <sup>nd</sup> stage of labor	<b>94</b>
<b>Table (12)</b>	Statistical comparison between the two studied groups as regards duration of 3 <sup>rd</sup> stage of labor	<b>96</b>
<b>Table (13)</b>	Statistical comparison between the two studied groups as regards apgar score 5min	<b>98</b>
<b>Table (14)</b>	Statistical comparison between the two studied groups as regards apgar score 10 min	<b>99</b>
<b>Table (15)</b>	Statistical comparison between the two studied groups as regards mode of delivery and its indication	<b>100</b>



## List of Figures

Figure No.	Title	Page No.
<b>Fig. (1)</b>	Maternal – Fetal Interactions	<b>9</b>
<b>Fig. (2,3,4,5)</b>	Mechanism of effacement, dilatation	<b>15</b>
<b>Fig. (6)</b>	Mechanism of effacement and dilatation during labor	<b>17</b>
<b>Fig. (7)</b>	Composite of the average dilatation curve for nulliparous labor	<b>26</b>
<b>Fig. (8)</b>	Modified WHO curve	<b>27</b>
<b>Fig. (9)</b>	Algorithm for management of low risk pregnancy beyond 40w of gestation	<b>55</b>
<b>Fig. (10)</b>	The placental-fetal adrenal endocrine cascade	<b>64</b>
<b>Fig. (11)</b>	Maternal and Fetal Endocrine Systems Involved in Increased Placental Production of CRH	<b>71</b>
<b>Fig. (12)</b>	Mean age, BMI and gestational age in dexamethasone group and control group	<b>85</b>
<b>Fig. (13)</b>	Mean pulse, systolic BP and diastolic BP in dexamethasone group and control group	<b>86</b>
<b>Fig. (14)</b>	Mean bishop score in dexamethasone group and control group	<b>87</b>
<b>Fig. (15)</b>	Mean Duration between induction of labor and active phase (hrs) in dexamethasone group and control group	<b>89</b>

---

## ☞ List of Figures ☜

---

<b>Figure No.</b>	<b>Title</b>	<b>Page No.</b>
<b>Fig. (16)</b>	Mean Duration of active phase of labor (hrs)in dexamethasone group and control group	<b>91</b>
<b>Fig. (17)</b>	Mean rate of cervical dilatation (cm/hr) in dexamethasone group and control group	<b>93</b>
<b>Fig. (18)</b>	Mean duration of 2 <sup>nd</sup> stage of labor (minutes) in dexamethasone group and control group	<b>95</b>
<b>Fig. (19)</b>	Mean duration of 3rd stage of labor (minutes) in dexamethasone group and control group	<b>97</b>
<b>Fig. (20)</b>	Comparison between Group I (Dexamethazone) and Group II (Placebo) as Regard APGAR Score 5 min.	<b>98</b>
<b>Fig. (21)</b>	Comparison between Group I (Dexamethazone) and Group II (Placebo) as Regard APGAR Score 10 min.	<b>99</b>
<b>Fig. (22)</b>	Comparison between Group I (Dexamethazone) and Group II (Placebo) as Regard Mode of Delivery.	<b>101</b>

## Abstract

**Aim of work:** To determine the effect of intramuscular administration of dexamethasone on the duration of labor Induction.

**Methods:** seventy two pregnant women were included in this study. (Study group and control group); each contain thirteen six pregnant women. Study group was injected with two ml dexamethasone and the control group was injected with two ml distilled water six hours before labor induction .Both groups were induced by same protocol till optimal contractions are reached.

**Conclusion:** An intramuscular injection of dexamethasone was found to shorten the duration of labor induction. Also it is found to shorten the duration of active phase and second stage of labor.

---

**Key words:** induction, labor, dexamethasone

## Introduction

Induction of labour is a common obstetric procedure which is performed for a variety of medical and non medical indications (*Schwarz et al., 2016*).

If the cervix is unfavourable , prior ripening of the cervix makes induction of labour easier and more successful. There are different methods for ripening of the cervix and making it ready for induction. These methods include medical methods such as the administration of prostaglandins (*Van Gemund et al., 2004*), and mechanical methods such as extra amniotic saline infusion (EASI), traction on the cervix with Foley catheter and laminaria (*Karjane et al., 2006*). One of the methods proposed for the speeding up of the labor process (labor induction) is use of corticosteroids (*Karjane et al., 2006*).

Although the effects of using these substances in the labor process is not well – understood, studies conducted on animals indicate the importance of the secretion of cortisol by adrenal glands in sheep fetuses and in fetuses of other animals on starting labor (*Sharami et al., 2005*). It has been observed that infusion of glucocorticoids into sheep fetuses causes premature birth induction (*Batista et*

*al., 2011*). These studies have prepared the way for bringing up the role of corticosteroids in the speeding up of labor induction in women. In studies carried out, corticosteroids have been employed using extra-amniotic and intravenous methods and in some of these studies, both methods have proved successful (*Levy et al., 2002*). Corticosteroids have been suggested for assisting in the ripening of the cervix (*Ziaei et al., 2003*). As the presence of the receptors for glucocorticoids on the amniotic membrane at the beginning of labor enhances the hypothesis that they probably have a role in the initiation of labor (*Kavanagh et al., 2006*). 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*). In various studies, researchers have shown that as in sheep, the production of cortisol in the adrenal glands of human fetus affects the fetus and the membranes through increasing placental CRH production (through a feed – forward cascade) which causes the myometrium to transform from the static to the contractile state. In addition

, cortisol has been proposed to affect the myometrium indirectly by stimulating the membranes to increase prostaglandin synthesis. furthermore, It has been revealed that the CRH derived from the placenta is an important factor in increasing maternal estrogens (especially esteriol) in the final stages of pregnancy. The resulting increase in estrogen brings about a change in the ratio of estrogen to progesterone, which promote the expression of a series of contractile proteins in the myometrium, leading to a loss of myometrial quiescence (*Hoffman et al., 2012*).

## **Aim of the Work**

The aim of this work is to evaluate the effect of intramuscular administration of dexamethasone on the duration of vaginal delivery in women undergoing induction of labor.

### **Research hypothesis**

In women undergoing induction of labour, IM dexamethasone may decrease the duration of labour

### **Research question**

In women undergoing induction of labour, Does IM dexamethasone decrease the duration of labour ?