

**Misoprostol before Elective Caesarean Section  
for Decreasing the Neonatal Respiratory  
Morbidity In diabetic patients**

**Master Degree in Obstetrics and Gynecology**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَقُلْ اَعْمَلُوا فَسَيَرَى اللَّهُ عَمَلَكُمْ  
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## **List of Abbreviations**

<b>Abbr.</b>	<b>Full-term</b>
<b>AA</b>	Arachidonic Acid
<b>ABCA 3</b>	ATP Binding cassette gne
<b>ABG</b>	Arterial Blood Gases
<b>AQP5</b>	Aquaporin 5 water channel
<b>ASUMH</b>	Ain Shams University Maternity Hospital
<b>ATP</b>	Adenosine Triphosphate
<b>BNP</b>	Brain Natriuretic Peptide
<b>BPD</b>	Bronchopulmonary Dysplasia
<b>CRF</b>	Case Record Form
<b>C.S</b>	Caesarean Section
<b>C.T</b>	Computed Tomography
<b>CDMR</b>	Caesarean Delivery on Maternal Request
<b>cGMP</b>	Cyclic Guanosine Mono Phosphate
<b>CI</b>	Confidence Interval
<b>CNS</b>	Central Nervous System
<b>CONSORT</b>	Consolidated Standards of Reporting Trials
<b>COX</b>	Cyclooxygenase
<b>C-PAP</b>	Continuous Positive Airway Pressure

<b>ECD</b>	Elective Caesarean Delivery
<b>ECMO</b>	Extra Corporal Membrane Oxygenation
<b>EDA</b>	Epidural Anaesthesia
<b>ENaC</b>	Epithelial Na Channels
<b>eNO</b>	Endothelial Nitric Oxide
<b>EP</b>	E Prostanoid receptor
<b>ET</b>	Endothelin
<b>GA</b>	General Anaesthesia
<b>HFOV</b>	High Frequency Oscillatory Ventillation
<b>HMD</b>	Hyaline Membrane Disease
<b>IM</b>	Intra muscular
<b>iNO</b>	Inhaled Nitric Oxide
<b>IP3</b>	Inositol Triphosphate
<b>IV</b>	Intra venous
<b>IVH</b>	Intra Ventricular Haemorrhage
<b>LDA</b>	Lactate Dehydrogenase
<b>MRI</b>	Magnetic Resonance Imaging
<b>mRNA</b>	Messenger Ribonucleic Acid
<b>NEC</b>	Necrotizing Enterocolitis
<b>NG</b>	Nasogastric
<b>NICHD</b>	National Institute Of Child Health and Human Development
<b>NICU</b>	Neonatal Intensive Care Unit

<b>N-SAIDS</b>	Non Steroidal Anti Inflammatory Drugs
<b>NTproBNP</b>	Plasma N terminal pro-B-type Natriuretic Peptide.
<b>PaCO<sub>2</sub></b>	Partial Pressure of Carbon Dioxide in Arterial Gas
<b>PaO<sub>2</sub></b>	Partial Pressure of Oxygen in Arterial Gas
<b>PDA</b>	Patent Ductus Arteriosus
<b>PGI<sub>2</sub></b>	Prostaglandin I <sub>2</sub> (Prostacyclin)
<b>PLA</b>	Phospholipase A
<b>PMT</b>	Pulmonary Mechanics Testing
<b>PPHN</b>	Persistent Pulmonary Hypertension
<b>PVR</b>	Pulmonary Vascular Resistance
<b>RCT</b>	Randomized Controlled Trial
<b>RD</b>	Respiratory Distress
<b>RDS</b>	Respiratory Distress Syndrome
<b>ROP</b>	Retinopathy of Prematurity
<b>RR</b>	Risk Ratio
<b>RR</b>	Respiratory Rate
<b>SR</b>	Sarcoplasmic Reticulum
<b>SVR</b>	Systemic Vascular Resistance
<b>T<sub>max</sub></b>	Time of maximum plasma concentration
<b>TTN</b>	Transient Tachypnea of The Newborn
<b>TXA<sub>2</sub></b>	Thromboxane A <sub>2</sub>

<b>US</b>	Ultrasound
<b>UK</b>	United Kingdom
<b>VLBW</b>	Very Low Birth Weight
<b>SD</b>	Standard Deviation
<b>SPSS</b>	Statistical Package for Social Science



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## Introduction

The increased incidence of the idiopathic respiratory distress syndrome (IRDS) in infants of diabetic mothers may be explained by preterm delivery and asphyxia but the metabolic derangement per se may also be responsible for the inadequate production of lung surfactant. In addition, the activities of key enzymes responsible for the production of these phospholipids are decreased in the fetal lung tissue. (*Tydénet al.,2017*).

Neonatal respiratory distress may occur in either term or preterm newborns with a higher relative risk in preterm, and whether born vaginally or through caesarean section, but in a higher percentage after elective caesarean section whose rate is rising either due to maternal request (*Minkoff et al., 2003*), obesity (*Poobalanet al., 2009*), and older maternal age (*Callaway et al., 2005*) than after normal vaginal delivery (*Zanardo et al., 2004*) or emergency caesarean section (*Hansen et al.,2007*).

It is responsible for 30% of neonatal deaths (*Harrison, et al., 2008*). It has several subdivisions:

One is the respiratory distress syndrome (RDS) which is called hyaline membrane disease, it can occur in about 1% of pregnancies as a result of a pathology in lung surfactant either qualitative or quantitative (*Whitsett et al., 2005*), and usually in preterm neonates (*Bland et al.,2008*).

Another is transient tachypnea of the newborn (TTN) in which there is respiratory distress and increased

respiratory rate due to delayed resorption of pulmonary fluid, as a result of defective catecholamine surge (*Faxelius et al., 1983*), its incidence is 5.7/1000 deliveries (95% CI;1.7-2.7)(*Morrison et al., 1995*).

And also includes persistent pulmonary hypertension in which the fetal pulmonary vascular resistance remains high and the pulmonary blood flow still low after delivery (*Whitsett et al., 2005*).

Catecholamines can stimulate pulmonary fluid reabsorption through acting upon beta-adrenergic receptors in fetal lung which present more late in gestation (*Bland, et al., 2008*), and thus enable the secretion of surfactant (*Whitsett et al., 2005*).

This surge of catecholamines can be provoked through prostaglandins given before caesarean section to pregnant diabetic females (*Singhet et al., 2004*) as those who are born vaginally are found to be adapted metabolically through a higher catecholamine level at birth (*Hagnevik et al., 1984*).

So, prostaglandins may be given about one hour before an elective caesarean section after excluding the presence of contraindication to their use to decrease the neonatal respiratory diseases and thus, the number of children who suffered from bronchopulmonary dysplasia that occurs frequently in children who had previously TTN will diminish (*Whitsett et al., 2005*).

The prostaglandins in common use are misoprostol (prostaglandin E<sub>1</sub>) and dinoprostone (prostaglandin E<sub>2</sub>). Prostaglandin E<sub>1</sub> (Misoprostol) is available as a cervical ripening agent in the form of 100 or 200 mcg tablets which can be taken orally, vaginally, or sublingually, their T<sub>max</sub> is 12 +/- 3 minutes with terminal half life ranging from 20 to 40 minutes (*Woodet al.,2001*).

Prostaglandins E<sub>2</sub> which are available as oral tablets, pessaries, or vaginal gels are uteroselective agents (*O'Brienet al., 1995*) widely used for induction of labour, start action within 10 minutes and become in full action after about 12 hours (*Rayburnet al., 1989*).

In a previous prospective study of 36 women scheduled for an elective caesarean section beyond 38weeks (*Motaze et al., 2013*),18 women received intravaginal prostaglanadin E<sub>2</sub> gel and 18 received placebo, there was one neonatal respiratory distress case in the control group which was reported as transient tachypnea of the newborn (risk ratio (RR) 0.33, 95% confidence interval (CI) 0.01 to 7.68) with similar Apgar score at one and five minutes and no need to mechanical ventilation nor side effects related to treatment in either group, so no difference in respiratory outcome reported although there was a significantly higher catecholamine level in the intervention group.

## **Aim of the work**

The aim of this study is to assess the efficacy of Prostaglandin  $E_1$  on the reduction of the neonatal respiratory morbidity in diabetic women scheduled for elective caesarean section.

Research hypothesis: In diabetic pregnant women undergoing elective C.S, Prostaglandin  $E_1$  may reduce neonatal respiratory morbidity.

Research question: In diabetic pregnant women undergoing elective C.S, Does prostaglandin  $E_1$  decrease the rate of neonatal respiratory morbidity ?