شبكة المعلومات الجامعية

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بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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HANAA ALY

Efficacy of Antenatal Prostaglandin E1versus Placebo In Prevention of Neonatal Respiratory Morbidity In Pregnant Women at Early Term Elective Caesarian Section: A Randomized Clinical Trial

Thesis

Submitted for partial fulfillment of the Master Degree in Obstetrics and Gynecology

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2021

*First, thanks are all due to **Allah** for Blessing this work until it has reached its end, as a part of his generous help throughout our life.*

*I would like to express my deep gratitude and sincere appreciation to **Dr. Tamer Ahmed Elrefaeey**, Assistant Professor of Obstetrics and Gynecology, Ain Shams University for his sustained support, continued encouragement, precious time, and efforts that made this thesis possible. It was a great honor for me to do this thesis under his supervision.*

*I owe special feelings of gratitude to **Dr. Maged Mahmoud El-Shorbagy**, Assistant Professor of Obstetrics and Gynecology, Ain Shams University for his great help, close supervision, wise opinions, guidance, continuous encouragement, and his precious efforts. Without his support, this work would not have been completed.*

*My deep appreciation is to **Dr. Mahmoud Mohamed Ghaleb**, Lecturer of Obstetrics and Gynecology, Ain Shams University for his valuable instructions, unlimited help, great deal of support, endless patience, experienced guidance, and helpful suggestions that brought this thesis to light.*

*Words fail to express my love, respect and appreciation to **my husband** for his unlimited help and support.*

A special word of thanks goes to my supportive family, who helped a lot at completing this thesis.

Samar Ali

ABSTRACT

Objective: to assess the efficacy of prostaglandin E1 (PGE1) in prevention of neonatal respiratory morbidity (NRM) especially transient tachypnea of newborn (TTN) before elective caesarian section (ECS).

Materials and methods: a randomized clinical trial (NCT04780412) was carried out in Ain Shams University maternity hospital between February and August 2020. After exclusion of those who did not meet the inclusion criteria and those who refused to participate, a total of 210 pregnant women between 37 and 38^{+6} weeks of gestation were allocated to 2 equal groups, a Misoprostol group who received 50 micrograms of vaginal Misoprostol, and a placebo group who received placebo, 90 to 120 minutes before the ECS.

Outcomes: The incidence of TTN, and the need for Neonatal Intensive Care Unit (NICU) admission for respiratory support.

Results: Regarding the incidence of TTN & the need for NICU admission, a significant statistical difference was found between the Misoprostol group (1%), and the Placebo group (17.1%) with a P-value < 0.001. Also, the APGAR scores at 1 and 5 minutes were significantly different among the 2 groups (7.8 ± 0.8, 9.4 ± 0.7 and 7.2 ± 1.3, 8.7 ± 1.5 for the Misoprostol and placebo groups, respectively) with a P-value < 0.001 for both 1 minute and 5 minutes scores.

Conclusion: administration of 50 micrograms of vaginal Misoprostol 90 to 120 minutes before the ECS can significantly reduce the incidence of TTN and the subsequent need for NICU admission.

Keywords: Cesarean section, misoprostol, neonatal respiratory morbidity, transient tachypnea of newborn, respiratory distress, prostaglandins

List of Contents

List of Abbreviations

Abbreviation	Full term
ABG	Arterial Blood Gases
ADMA	Asymmetric Di-Methyl Arginine
AQP5	Aquaporin 5
ASUMH	Ain Shams University Maternity Hospital
AT2 cells	Alveolar Type II cells
BPD	Bronchopulmonary Dysplasia
cAMP	cyclic Adenine Mono Phosphate
CBC	Complete Blood Count
CI	Confidence Interval
CPAP	Continuous Positive Airway Pressure
CRP	C-Reactive Protein
CTG	Cardio-Toco Gram
DPPC	Di-Palmitoyl Phosphatidyl-Choline
ECS	Elective Caesarian Section
EGF	Epidermal Growth Factor
FiO2	Inspired Oxygen Fractional Pressure
IDM	Infants of Diabetic Mothers
IQR	Interquartile Range
IV	Intravenous
Min.	Minute
Na+	Sodium ions
nCPAP	nasal Continuous Positive Airway Pressure
NICU	Neonatal Intensive Care Unit
NRG-1β	Neuregulin-1β
NRM	Neonatal Respiratory Morbidity

Abbreviation	Full term
PASS II	Power Analysis and Sample Size
PCW	Post-Conception Weeks
PDA	Patent Ductus Arteriosus
PG	Phosphatidyl-Glycerol
PL	Phospho-Lipids
PPHN	Persistent Pulmonary Hypertension Of Newborn
RDS	Respiratory Distress Syndrome
SD	Standard Deviation
SP	Surfactant Proteins
SPSS	Statistical Package for Social Sciences
T_3	Triiodothyronine
T_4	Thyroxine
T_{max}	Time to peak plasma concentration
TRH	Thyrotropin Releasing Hormone
TTN	Transient Tachypnea of Newborn
V/Q	Ventilation Perfusion Ratio

List of Tables

List of Figures

Introduction

Neonatal respiratory morbidities (NRM) represent a common group of post natal complications including respiratory distress syndrome (RDS), transient tachypnea of newborn (TTN), and persistent pulmonary hypertension of newborn (PPHN); being responsible for 30% of neonatal mortalities. They have a greater relative risk in preterm than in full term, and also in elective caesarian section (ECS) than in vaginal delivery. (Plunkett et al., 2019)

They have serious sequelae that may require admission to a neonatal intensive care unit. And since ECS rate has been steadily rising globally recently reaching about 20% worldwide (Kirchengast & Hartmann, 2019), NRM are therefore becoming a more important issue than ever.

The best way of decreasing the incidence of NRM in ECS is by delaying the delivery beyond 39 weeks of gestation as long as early termination of pregnancy is not indicated. (Pirjani et al., 2018)

The second currently approved method is by using doses of corticosteroids prenatally. But this method did not

prevent the occurrence of NRM totally. It also had other adverse effects on the newborn. (Ojha, 2018)

Another proposed method was by using prostaglandins. Several mechanisms of action are hypothesized. This method may prove more effective in decreasing the incidence of NRM in ECS, with the facility of administering the medication just 1 to 2 hours prenatally, and with less adverse effects. (Abbas et al., 2019)

Commonly used prostaglandins include Misoprostol (Abbas et al., 2019) and Dinoprostone. (Nv et al., 2013)

In a previous prospective study on efficacy of intravaginal prostaglandin E2 in decreasing NRM in ECS after involving 36 full term women, the case group, including 18 women received intravaginal prostaglandin E2. The other 18 women in the control group received placebo gels. The results reported one case of NRM in the form of TTN in the control group with steady Apgar score at one minute and five minutes without need for mechanical ventilation. Both groups showed no side effects for treatment. So, prostaglandin E2 showed insignificant efficacy in reducing NRM in ECS at full term even though having a significant effect on stimulating

catecholamine surge but the quality of evidence was graded low because the sample size was small and there were few events, thus this review was insufficient to judge the relationship between efficacy of prostaglandins and neonatal respiratory morbidity. (Nv et al., 2013)

In 2017, *Khairy et al.* conducted a study on 120 women aging 38 to 38^{+6} weeks of gestation divided into 2 equal groups, intervention and placebo groups. Each woman in the intervention group received 200 micrograms of vaginal Misoprostol 1 hour before caesarian section. It was noted that none of the newborn of the Misoprostol group had NRM or needed NICU admission. In contrast, 26.7% of the control group had TTN and required admission to the NICU.

Aim of the Work

The importance of this study is to prove or deny the efficacy of 50 micrograms of vaginal prostaglandin E1 in reduction of incidence of NRM, mainly TTN, in gestational ages between 37 weeks and 38^{+6} weeks in elective caesarian section.