

Use of Antenatal corticoSteroid Before Elective
cesarean Delivery Near Term or After 34 Weeks
Gestation

Protocol of Thesis
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Introduction:

Antenatal glucocorticoids have been used for 30 years to induce maturation of preterm fetal lung. Stimulation of pulmonary surfactant system has been regarded as the most important effect of antenatal glucocorticoids. As there is evidence that glucocorticoids induces genes associated with the synthesis of surfactant proteins, fatty acidsynthase, the epithelial sodium channel & membrane protein sodium/ potassium, ATPase as well (*Grier DG and Halliday H.L, 2004*).

Respiratory morbidity in near term after or at 34 weeks and before 37 weeks infant delivered spontaneously or by elective cesarean delivery & significant number of admission to intensive care units among those neonates. **When infants are delivered** near or at term especially by elective cesarean delivery before the onset of spontaneous labour is often deprived of hormonal changes resulting in immaturation of the fetus and occurrence of preterm delivery & neonatal distress syndrome (*Lucky Jain M.D, Douglass C. Eaton PHD, 2005*).

Is the use of antenatal corticosteroids effective therapy? Is there is benefit after 34 weeks gestation? who are the candidates for antenatal corticosteroid therapy?, when is the optimal time to treat? Which are the optimal steroids; what is the ideal dose & route of administration? Are there any contraindications to administration of ACS? Are antenatal corticosteroids indicated in women with premature rupture of membranes? Is use of ACS recommended in pregnancies complicated by maternal diabetes mellitus? Should the treatment with corticosteroid betreated? (*Miracle X, Direnzo GC, Stark A et al., 2008*).

There is evidence supporting the use of repeated courses of antenatal steroids. Both human & animal studies offer evidence that repeated courses of corticosteroids improve neonatal pulmonary outcomes especially for the infant delivered at earlier gestational ages. Although there is also evidence to suggest altered neuronal maturation & intrauterine growth restriction if administered with repeated steroids. Human studies have shown that birth weight reduction was only seen in those infant treated with 4 or more courses of corticosteroids (*Bonanno C, Puchs K et al., 2007*).

Antenatal steroids for accelerating fetal lung maturation for women at risk of preterm birth or elective cesarean delivery. So the overall reduction in neonatal death, occur with administration of antenatal corticosteroids near term or after 34 weeks (*Roberts D and Dalziel S, 2006*).

Antenatal glucocorticoid therapy remains one of the most striking successes in the perinatal management of complicated pregnancies that result in premature birth. The anti- inflammatory and maturative properties of fluorocorticoids are such that all women at risk of preterm delivery before 34 weeks gestation should be treated. Betamethasone is preferred to dexamethasone and no more than two courses, 2 weeks apart, should be given until the evidence from further controlled trials on repeated doses becomes available. In particular, the early use of postnatal dexamethasone should be avoided in preterm infant because of the deleterious effects on neurological development, including not only cerebral palsy but cognitive function and psychiatric- related behavior. Treatment with other steroids should be restricted to the context of randomized controlled trials (*Baud O, Sola A, 2007*).

Research question

Is use of antenatal steroid before elective cesarean delivery after 34 weeks effective in preventing neonatal respiratory distress syndrome?

Research hypothesis

The outcome of pregnancy in case of administration of antenatal steroid before elective cesarean delivery is better than no treatment given, after 34 weeks as regards the occurrence of RDS & admission to intensive care units.

Research null hypothesis:

There is no difference in outcome of pregnancy either with antenatal steroid administration before elective cesarean delivery after 34 weeks or not.

Aim of the work:

To study the role of antenatal steroid in improving of neonatal outcomes in pregnant women after 34 weeks before elective cesarean delivery.

Medical application:

Antenatal administration of steroid stimulates the fetal lung maturity therefore decreases incidence of respiratory distress syndrome & neonatal respiratory complications associated with elective cesarean delivery. This will decrease the economic impact

on the government as regards the cost of incubators and decrease neonatal mortality rates.

Selection of the subject population under study:

The sample of population under the study will be selected according to:

Inclusion criteria:

- Pregnant woman between 20-40 years.
- All pregnant women after 34 weeks of pregnancy.
- All pregnant women will under go elective cesarean delivery due to persistent indication of cesarean section.
- Single or multiple pregnant.

Exclusion criteria:

- Immunocompromised patients.
- Any known contraindications to the use of antenatal corticosteroids.
- Any associated medical disorders problems with pregnancy for example diabetes mellitus, hypertension, etc.....

Recruitment:

- Participants are chosen from AIN SHAMS UNIVERSITY MATERNITY HOSPITAL & INTERNATIONAL MANSOURA HOSPITAL. Who are admitted to the hospital for elective cesarean delivery.

Consent process:

- The population sample under study will be instructed about research protocol and informed content are granted from each participant before randomization.

Study Design:

The subject population will undergo (randomized controlled prospective study. As the sample is divided into 2 strata.

- 1- **Trial arm** (pregnant women between 34-37 weeks pregnancy).
- 2- **Trial arm** (pregnant women after 37 weeks pregnancy).

Randomization:

Participants will be randomized to either trial arm using sample randomization with 1:1 ratio.

- Sequence generation: computer – generated random numbers.
- Allocation concealment:
 - o Telephone verification of arm allocation after revision of Inclusion & exclusion criteria.

Blinding:

- Care givers.
 - Participants
 - Out comes assessors are blinded to trial arms.
- } Not blinded

Study Methodology:

Procedures are done as standard antenatal care which includes:

- (1) Proper personal, menstrual & obstetric history taking to be sure of gestation age.
- (2) Calculation of gestational ages according to NAEGLE'S rule
- (3) Recent ultrasound examination to assess the viability & maturity of the fetus.

The patients of both trial arms who will receive antenatal steroid done by Gynecology & Obstetric physician who will give dexamethasone either in 2 dose each 12 mg (12 hrs apart) or 4 doses each 6mg (12 hrs apart) given by intramuscular route 24-48 hrs before elective cesarean delivery.

Data collection:

Outcomes of pregnancy of trial arm I in which half of them are given antenatal steroid are compared to outcomes of pregnancy of **trial arm II** who are given steroid also (for respiratory distress syndrome & admission to neonatal intensive care units done within 48 hrs after delivery).

Data or results which are collected after arrangement in suitable manner by a process known as processing of data which may be manual or computerized.

These data should be confidentially protected.

Each patient in each trial arm should have sheet or file for registration of code no., storage of historical information, physical examination, the most recent U/S, any associated medical or obstetric problems. Also to outline the steps of procedure of administration of antenatal steroid and indications of elective delivery, outcome of the elective cesarean delivery for prematurity & its complications, effect of antenatal steroid in the improvement of fetal lung maturity.

Presentation of Data:

Results or data collected are presented in diagrams or table shape regarding the relation of administration of antenatal steroid in **Trial arm I & II** & improvement of fetal lung maturity.

Statistical consideration:

After presentation of data two end points will appear showing either primary or secondary outcome variables.

- a- Primary outcome measures: include incidence of admission to neonatal intensive care units for respiratory problems.
- b- Secondary outcome variables: which are the actual aim of study to decrease financial load of families and decrease incidence of neonatal death and cost of incubations also it is life saving and cost effective intervention and the rate of respiratory distress syndrome and decrease length of stay in neonatal intensive care units and readmission rates.

Sample Size :

Admission to neonatal intensive care units in planned elective cesarean delivery is 10%.

To show a 10% decrease in admission to neonatal intensive care units, the sample will have 80% power for type I error of 0.05

(P.value).

Trial arm I 120 in number & trial arm II 120 number.

Continuous Data :

Independent sample t test or Mann Whitney test

Categorical data :

Fisher's exact test or χ^2 test

Trial arm :

Arms : 1- intervention : Antenatal Steroids

2- comparison : No Treatment

sub group analysis :

1- gestational age ≥ 37 w_s

2- gestational age (34 - < 37) w_s

References

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