Dexamethasone Effect on Induction-Delivery Interval at Term Randomized Controlled Trial

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Abstract: Background: Induction of labor is one of the most common interventions practiced in modern obstetrics. In the developed World, the ability to induce labor has contributed to the reduction in maternal and perinatal mortality and morbidity. During pregnancy, large amounts of CRH are released from the placenta and fetal membranes. An increment in plasma CRH concentration occurs during spontaneous labor, with peak value at vaginal delivery. **Aim:** The aim of this study is to establish whether Dexamethasone plays a role in shorting the duration interval between initiation of labor induction and beginning of the active phase of labor in primigravida post-term pregnancy, so shorting the duration of labor. **Methodology:** This randomized controlled trial was conducted at Ain-Shams University Maternity Hospital. 102 full term & post-term (≥ 40 weeks) nulliparous women were included in this study and divided into the following: Group I (Dexamethasone group) injected with 2 ml (8 mg) dexamethasone intravenously 4 hours before initiation of labor induction and Group II (placebo group) will not receive dexamethasone or any other cervical ripening agent. **Results:** There was a non-significant statistical difference between the two studied groups as regards the age, gestational age on admission, body mass index (BMI), pulse, systolic, diastolic blood pressure, primary cervical dilatation, effacement, cervical position, consistency, head station, Bishop Score, mode of delivery and Apgar score. **Conclusion:** Single intra-venous injection of two ml. (8mg.) of dexamethasone before induction of labour appears to shorten labor duration. **Recommendations:** Intra-venous injection of dexamethasone a dose of 2 ml. (8 mg) is a safe and effective dose for shorting labor duration. Larger randomized controlled studies should be carried out for longer duration to reach the safest regimen of dexamethasone before induction of labor.

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1. 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 **(1).**

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 **(2).**

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 **(3).**

The success of induction and labor progression is dependent on the condition of the cervix before induction initiation **(4).**

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 **(5).**

A prolonged gestation is more likely to occur when the fetus has congenital adrenal hyperplasia caused by 2l-hydroxylase deficiency, which may be due to an impaired cortisol production **(6).**

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 **(7).**

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 **(8).**

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 [8].

A previous study by **Laloha et al.** [9] reported that the mean ± SD interval from initiation of induction of labor to the beginning of the active phase was 2.87 ± 1.57 hours versus 3.8 ± 1.72 hours in women receiving dexamethasone or placebo, respectively.

Aim of the Work

This study aims to evaluate the effect of intra-venous injection of a single dose of dexamethasone in shortening the duration interval between initiation of labor induction and delivery of the fetus in primigravida full-term pregnancy.

2. Patients and Methods

Type of study:

Double blind randomized controlled trial.

Study settings:

Site: Ain Shams Maternity Hospital

Study duration: 6 months

Study population:

One hundred and two pregnant women were recruited in this study from women attending the emergency room department of obstetrics and gynecology at Ain Shams University.

Inclusion criteria:

- Primiparity.
- Singleton pregnancy.
- Gestational age i.e. 40 weeks or more by date or 1st trimestric ultrasound.
- Bishop score of 4 or greater.
- Longitudinal lie.
- Vertex presentation.
- Intact membranes.

Exclusion criteria:

- Refused consent.
- Malpresentation.
- Multiple pregnancies.
- Active phase of labour.
- Rupture of membranes (ROM).
- Cephalo-pelvic disproportion.
- Previous C-section or myomectomy operation.
- Known contraindication or hypersensitivity to Dexamethasone.
- Fetal distress.
- IUFD.
- Current maternal disorder e.g. diabetes mellitus and pregnancy induced hypertension.
- Over distended abdomen e.g. fetal macrosomia or polyhydramonus suggested by ultrasound.
- Ante-partum hemorrhage e.g. placenta previa, accidental hemorrhage.

❖ **These criteria were assessed at first during the initial evaluation in the delivery suite as follows:**

History:

Personal, menstrual, obstetric, past and family history will be taken. History of present pregnancy was taken including the first day of last menstrual period, duration of pregnancy, warning symptoms as headache, visual symptoms, edema of face and fingers, excessive vomiting, heart burn, epigastric pain, vaginal bleeding, decreased fetal movements, edema of the lower limbs and history of any drug intake.

Examination:

a. **General examination:** vital signs, chest, heart and lower limb examination.

b. **Abdominal examination:** for assessment of fundal level, presentation, expected fetal weight, fetal heart rate and presence of scars of previous operations as cesarean section or myomectomy.

c. **Vaginal examination:** for assessment of cervical dilatation and effacement at the beginning, state of fetal membranes, station of fetal head, position of fetal head and pelvic adequacy.

Investigations:

a. **Laboratory:** blood grouping, Rh typing, complete blood count.

b. **Abdominal ultrasound:** to confirm the gestational age, fetal number, viability, presentation, position, estimated fetal weight, and to detect the grade of placental maturity, amount and turbidity of liquor.

c. **CTG:** application of CTG half an hour to all participates before starting any intervention.

Enrollment and Allocation of the patients:

After approval of health ethical committee in Ain Shams Hospital and after the initial evaluation, women who fulfilled the appropriate inclusion and exclusion criteria were invited to participate in the study, a verbal consent was obtained from each candidate after explanation of the procedure in details.

Randomization:

The eligible 102 women were randomized into one of the following two groups:

1. **Group D (study group):** including 51 women who received a prefilled syringe with two milliliters (8 mg) of dexamethasone intravenously.
2. **Group P (control group):** including 51 women who received a prefilled syringe with two milliliters of distilled water intravenously.

No cervical ripping agent was used for induction of labor in either group.

Randomization was performed using a computer-generated randomization system. 102 opaque envelopes were numbered serially; each envelope was contain the corresponding letter in the randomization

table, and when the first pregnant woman arrived, the first envelope was opened and the pregnant woman was allocated to the group according to the inside letter.

During hospitalization, vaginal examination was performed also amniotomy was performed at 2-3 cm for all patients, 4 hours after the initial dose, the labor induction was started via Oxytocin using the following protocol [10]:

a) Initial dose of oxytocin... 1 to 2 mIU/min.
b) Increase interval..... 30 minutes.
c) Dosage increment..... 1 to 2 mIU.
d) Usual dose for good labour..... 8 to12 mIU/min.
e) Maximum dose……..... 30 mIU/min. [10]

6 hours after inductions, patients who didn't enter the active phase of labor were considered non-responsive and oxytocin was discontinued.

II- The interval between the initiation of induction and the beginning of the active phase of labor was recorded (a cervical dilatation of 4 cm plus 3 forceful contractions over a 10-minute span each last from 40-60 Sec).

III- Partographic representation for progression of active phase of labor:

a) Frequency and duration of uterine contraction.
b) Cervical dilatation was recorded every two hours by per vaginal examination.
c) Station and position of fetal head was noted at the same time.

IV- After delivery:

a) The duration of the first stage of labor was recorded **(**Partographic representation was done for each participant).
b) The duration of the second stage of labor was recorded.
c) The duration of the third stage of labor was recorded.
d) The neonatal outcome was recorded by APGAR score.
e) Any postpartum maternal adverse effect was noted (e.g. vital sing abnormality, any maternal postpartum hemorrhage and CNS manifestation).

Primary outcomes:

The interval between the initiation of induction and the delivery of the fetus.

Secondary outcomes:

(a) The duration of the first stage of labor (Partographic representation was done for each participant).
(b) The duration of the second stage of labor.
(c) The duration of the third stage of labor.
(d) The neonatal outcome by APGAR score.
(e) Any postpartum maternal adverse effects (e.g. vital sing abnormality, any maternal postpartum hemorrhage and central nervous system manifestation).

3. Results

This study started with 102 nulliparous term pregnant women which was conducted at the labor ward of Ain-Shams Hospital.

The studied patients were randomized into two groups:

- Dexamethasone group: This group included 51 pregnant women (N = 51).
- Control group: This group included 51 pregnant women (N = 51).

Data were collected in a specific record forms, results were tabulated and statistically analyzed as shown below.

Table (1): Statistical comparison between the two studied groups as regard age, gestational age and body mass index (BMI) on admission date

	Dexamethasone group (n = 51)	Control group (n = 51)	t-test	P-value	Sig.
Age (year)	26.99±2.27	26.37±2.37	0.104	0.076	NS
BMI	24.10±1.44	23.79±1.06	0.289	0.211	NS
Gestational age on admission date (wks)	40.79±1.50	40.69±1.39	1.035	0.750	NS

Value are mean±SD
N.S.: Non-significant

There were non-significant statistical differences between the two study groups as regard the age and gestational age.

There were non-significant statistical differences between the two groups as regard BMI.

Table (2): Statistical comparison between the two studied groups as regard pulse and blood pressure at time of intervention

	Dexamethasone group (n = 51)	Control group (n = 51)	t-test	P-value	Sig.
Pulse (bpm)	81.68±4.22	81.58±3.61	0.897	0.693	NS
Systolic BP	129.16±11.54	127.72±12.15	0.600	0.463	NS

Diastolic BP	81.16±8.45	80.96±8.55	0.994	0.768	NS

N.S.: Non-significant
bpm: Beat per minute
BP: Blood pressure

There were no significant statistical differences between the two groups as regard pulse and blood pressure.

Table (3): Statistical comparison between the two studied groups as regard bishop score at time of intervention

	Dexamethasone group (n = 51)	Control group (n = 51)	t/χ^2	P-value	Sig.
Cervical dilatation (cm)	2.9±0.6	2.8±0.5	0.814	0.566	NS
Effacement (%)	47±7.4	45±5.8	0.154	0.107	NS
Consistency					
Intermediate	22(42%)	23(44%)	0.966*	0.672	NS
Soft	29(58%)	28(56%)			
Position					
Posterior	3(6%)	3(6%)			
Central	25(52%)	26(50%)	1.126*	0.783	NS
Anterior	23(42%)	22(44%)			
Station of fetal head					
-2	13(26%)	13(26%)			
-1	6(10%)	14(28%)			
0	26(52%)	18(34%)	0.121*	0.084	NS
+1	6(12%)	6(12%)			
Total bishop score	8.01±0.69	8.01±0.74	0.004	0.800	NS

There were no significant statistical differences between the two groups as regard cervical dilatation, effacement, cervical position, consistency, head station and total bishop score.

Table (4): Statistical comparison between the two studied groups as regard duration between initiation of labor induction and beginning of active phase of labor

	Dexamethasone group (n = 51)	Control group (n = 51)	t-test	P-value	Sig.
Duration between induction of labor and active phase (hrs)	2.6±0.9	3.5±0.4	2.691	< 0.001*	HS

H.S.: Highly significant

There was a high significant statistical difference between the two groups as regard duration between labor induction and active phase of labor ($P < 0.001$).

Table (5): Statistical comparison between the two studied groups as regard duration of active phase of labor

	Dexamethasone group (n = 51)	Control group (n = 51)	t-test	P-value	Sig.
Duration of active phase (hrs)	5.23±0.8	6.01±0.5	2.981	< 0.001*	HS

H.S.: Highly significant

There was a high significant statistical difference between the two groups as regard duration of active phase of labor ($P < 0.001$).

Table (6): Statistical comparison between the two studied groups as regard rate of cervical dilatation

	Dexamethasone group (n = 51)	Control group (n = 51)	t-test	P-value	Sig.
Rate of cervical dilatation (cm/hr)	1.32±0.22	1.17±0.08	1.913	< 0.001*	S

S: Significant

There were significant statistical differences between the two groups as regard rate of cervical dilatation ($P < 0.001$).

Table (7): Statistical comparison between the two studied groups as regards duration of 2nd stage of labor

	Dexamethasone group (n = 51)	Control group (n = 51)	t-test	P-value	Sig.
Duration of 2nd stage of labor (minutes)	29.11±8.41	32.3±7.92	1.427	0.043*	S

S: Significant

There was significant statistical difference between the two groups as regards duration of second stage of labor ($P < 0.05$).

Table (8): Statistical comparison between the two studied groups as regards duration of 3rd stage of labor

	Dexamethasone group (n = 51)	Control group (n = 51)	t-test	P-value	Sig.
Duration of 3rd stage of labor (minutes)	8.73±2.99	9.62±3.01	0.321	0.096	NS

NS: non Significant

There was no significant statistical difference detected between the two groups as regard duration of third stage of labor ($P > 0.05$).

Table (9): Statistical comparison between the two studied groups as regard mode of delivery and CS indications.

	Dexamethasone group (n = 51)	Control group (n = 51)	Chi-square test	P-value	Sig.
SVD	44(86%)	42(82%)	2.416	0.482	NS
Cesarean Section	7(14%)	9(18%)			
Failed induction	2(3.9%)	4(7.8%)	0.708	0.678	NS
2ry arrest of cervical dilatation	2(3.9%)	2(3.9%)	0.000	1.000	NS
Fetal distress	2(3.9%)	3(5.9%)	0.210	1.000	NS
Deep transverse arrest	1(2%)	0(0%)	1.01	1.000	NS

SVD: Spontaneous vaginal delivery; CS: Cesarean section; NS: Non-significant

There were no significant statistical differences between the two groups as regards mode of delivery.

Table (10): Statistical comparison between the two studied groups as regard Apgar score

	Dexamethasone group (n = 51)	Control group (n = 51)	t-test	P-value	Sig.
Apgar score at 1 min	7.98±0.53	7.88±0.53	0.481	0.263	NS
Apgar score at 5 min	8.51±0.46	8.51±0.46	0.000	1.00	NS

N.S.: Non-significant

There were no significant statistical differences between the two groups as regard Apgar score.

4. Discussion

It is well known that glucocorticoids accelerate lung maturation by enhancing surfactant synthesis in the pulmonary alveolar cells. Evidence has been obtained from early studies that the phospholipid content of surfactant provides a source of arachidonic acid that can be used by the amnion for prostaglandin synthesis. Recently there is direct evidence pointing to surfactant protein A (SP-A) as the key link between the maturing fetus and the initiation of parturition in the mouse [11].

Glucocorticoids derived from the maturing fetal hypothalamus-pituitary-adrenal axis play a crucial role in, triggering parturition **(Challis et al., 2005).**

In humans, the placenta synthesizes corticotrophin-releasing hormone (CRH), and the exponential rise of this hormone in maternal plasma correlates with the timing of birth [12].

The corticotrophin-releasing hormone (CRH), which has been identified in various organ systems, including the female reproductive system, is the principal regulator of the hypothalamic-pituitary-adrenal axis. Circulating placental CRH is responsible for the physiologic hypercortisolism of the latter half of pregnancy and plays a role in the onset of labor [13].

Cortisol increases the production of prostaglandins in the fetal membranes by either up regulating prostaglandin synthesis levels or down regulating 15-hydroxy prostaglandin dehydrogenase (PGDH) [14].

Therefore, glucocorticoids also play an important role in human parturition. In the fetal membranes, the actions of glucocorticoids are amplified by the actions of 11β-HSD steroid dehydrogenase type I (11β-HSD1), where 11β-HSD1 converts biologically inert cortisone to active cortisol thereby increasing the local levels of biologically active glucocorticoids. This

cascade of events initiated by glucocorticoids may play an important role in the positive feed-forward mechanisms [15].

This present study was been conducted in the labor ward of Ain-Shams University Maternity Hospital to evaluate the effect of a single intravenous administration of dexamethasone on the duration of labor, and its possible adverse effects.

This study comprised 102 primigravida, singleton pregnancy, longitudinal lie, vertex presentation with intact membranes who admitted to the labor ward for induction of labor because of full-term pregnancy (gestational age ≥40 weeks), with bishop score of 4 or greater. They had been equally devided in to two groups; group (D) **(dexamethasone group)** included patients received 8 mg (2 ml) of the product dexamehazone sodium phosphate intra-venously 4 hours before intiation of labour induction. Group (P) **(placebo group)** included patients received (2 ml) of distilied water intra-venously 4 hours before intiation of labour induction.

During hospitalization, vaginal examination was performed also amniotomy was performed at2-3 cm for all patients. 4 hours after injection, the labor induction will start via Oxytocin using the following protocol:

a) Initial dose of oxytocin..... 1 to 2 mIU/min.
b) Increase interval…..... 30 minute.
c) Dosage increment..... 1 to 2 mIU.
d) Usual dose for good labour.... 8 to12 mIU/min.
e) Maximum dose…….... 30 mIU/min.

6 hours after inductions, patients who didn't enter the active phase of labor were considered non-responsive and oxytocin was discontinued.

During the active phase uterine contractions were assessed and recorded in terms of severity frequency and duration. Fetal heart rate was monitored by means of cardiotopography, vaginal examination was preformed every two hours to assess labor progress.

The time of injection, bishop score on admission, injection interval to onset of active phase and its duration, time of entry to second and third stages of labor and duration of each stage, and placental expulsion were recorded.

As regarding our results, the study showed there were no significant statistical difference between the two studied groups regarding the mean maternal age (years), the gestational age (weeks) on admission, pulse (beat per minute) and blood pressure; No such difference was found regarding body mass index (BMI) tables (1, 2).

In addition, there were non-significant statistical differences between the two groups as regard primary Bishop score (cervical dilatation, effacement, cervical position, consistency, head station and total Bishop score). Table (3).

Our study showed that the duration between initiation of labor induction and beginning active phase of labor was shorter in dexamethasone group (2.6±0.9 hours) than in control group (3.5±0.4 hours) and the difference between 2 groups was highly statistically significant (P<0.001) Table (4).

The result of this study were in agreement with those by **Laloha et al.** [9] who conducted a double – blind randomized clinical trial on 172 participants with nulliparity, bishop score of 4 or greater, pregnancy duration in or before 40 weeks then divided in to dexamethasone (case) group and control group. the case group received an single dose of 8 mg dexamethasone intravenously and the control group with placebo 2 cc of normal saline, 4 hours latter induction was performed by standard protocol using oxytocin so that patient could enter active phase of labor (3 regular contractions in 10 minutes with diltation of 3-4 cm). Found that the interval between initiation of labor induction and beginning of active phase of labor was significantly shorter in the dexamethasone group than the control group (3.09±1.5 hours vs. (2.87±0.93 hours vs. 3.80±0.9 hours) respectively. They concluded that intravenous dexamethasone reduces the time duration from the induction to the onset of active phase of labor.

Also our results coincide with **Ziaee et al.** [16] that aimed to determine the effect of intra-muscular injection of dexamethasone on induction of labor. Women in 41 weeks gestational age and Bishop score greater than or equal to 7 received intramuscular injections of 10 mg dexamethasone in two doses with 12 hours interval, and the next day, induction was carried out using oxytocin. These patients were compared with patients in similar conditions, but receiving oxytocin. In this study, more of the patients from dexamethasone group entered active phase than that in control group, and interval between induction and onset of active phase was shorter in this group than in control group. They reported that intra-muscular injection of dexamethasone before labor induction reduced the time between the induction and the active phase of labor**,** despite of different route of administration, dosage and bishop score our results were consistent with the results of this study [16].

Unlike the results of our study; **Kavanagh et al.** [17] reviewed a clinical trial conducted on 66 pregnant women on which the effect of prescribing intramuscular dexamethasone together with intravenous oxytocin was compared with the effect of using oxytocin alone. They raised the point that corticosteroids were not effective in inducing labor and this method had not become popular and required further research. They involved a small number (66

pregnant women), a different route of administration and the primary outcome vaginal birth within 24 hours was not recorded.

Our findings were consistent with **Hajivandi et al.** [18] who found that mean interval between induction of labor and onset of active phase, and also duration of induction in the case group receiving dexamethasone were significantly shorter than in control group (3.1±0.68 hours vs. 4.2±1.3 hours) respectively. They concluded that intramuscular dexamethasone reduces the time duration from the induction to the onset of active phase of labor. Despite of the different route of administration our results were in agreement with the results of this study.

Our results were similar to **Mansouri et al.** [19] who tried to show the effect of extra-amniotic administration of corticosteroids to shorten the times to either active labor and/or delivery. 65 patients who were candidates for the termination of pregnancy between the ages of 16-45, with intact membranes and unripe cervix were randomly divided into two groups, a study group (n=34) and a control group (n=31). In the study group, 20 mg of dexamethasone was infused through a Foley catheter into the extra-amniotic space and the infusion was continued with normal saline in both groups. The result of the study showed that the interval of induction to active phase of labor was shorter in the study group compared to control group. The interval of induction to delivery was shorter in the study group compared to the control group. They concluded that corticosteroids might have a role in shortening the interval of induction to active phase of labor and the interval of induction to delivery despite of the different route of administration [19].

Results of **Hajivandi et al.** [18] **and Mansouri et al.** [19] somewhat agrees with those of ours (that the average length of time between labor induction and the start of active phase in the experimental group was shorter than that of the control group), however different dosage and route of administration of dexamethasone were used.

The present study estimate the duration of active phase of labor in each study group and the result showed that the dexamethasone group had highly significant shorter duration of active phase of labor than in the control group (5.23±0.8 hours vs. 6.01±0.5 hours) Table (5).

On the contrary the results obtained by **Hajivandi et al.** [18] found that the control group receiving normal saline had less duration of active phase of labor compared to group receiving intramuscular dexamethasone but they didn't reach any statistical significance. Also, **Kashanian et al.** [20] found that there was no significance difference between the 2 groups in the duration of active phase of labor. The difference between our results and these results may be due to usage of a different route of administration.

In our study the two studied groups were compared as regard rate of cervical dilatation. The results showed that there were significant statistical differences between the two studied group as regard mean rate of cervical dilatation (1.32±0.22 cm/hr vs. 1.17±0.08 cm/hr) Table (13).

The present study showed that the duration of second stage of labor was shorter in dexamethasone group (29.11±8.41 minutes vs. 32.3±7.92 minutes) and this reach a significant difference between the two groups Table (7).

These results were in agreement with those reported by **Kashanian et al.** [20] who found that mean duration of the second stage of labor in the dexamethasone group was significantly shorter than the corresponding durations for the control group (22.23±16.09 minutes vs. 29.01±15.32 minutes) (P=0.01).

In our study we compared between the two studied groups as regard duration of third stage of labor. The results showed that there was no significant statistical difference detected between the two groups as regard mean duration of third stage of labor (P=0.096), although the duration of third stage of labor was shorter in dexamethasone group (8.73±2.99 vs. 9.62±3.01 min in control group) Table (8).

The results of this study agree with those reported by **Kashanian et al.** [20] who found that there was no significant difference between the 2 groups in the duration of third stage of labor.

In our study we compared between the two studied groups as regard mode of delivery and C.S indications, there were no significant statistical difference between the two groups as regards mode of delivery and C.S indications as failed induction, 2ry arrest of cervical dilatation, fetal distress, deep transverse arrest Table (9).

These results were in agreement with those reported by **Kashanian et al.** [20] who found that, there were no significant statistical difference between the two groups as regards mode of delivery & C.S indications as failed induction, 2ry arrest of cervical dilatation, fetal distress, deep transverse arrest.

The present study showed that there was no a significant statistical difference between both groups as regarding Apgar score at 1 and 5 minutes (p value =0.263) and (p=1.00) respectively Table (10).

Also similar results have been reported by **Kashanian et al.** [20], **Hajivandi et al.** [18] **and Laloha et al.** [9] they found that there there were insignificant differences between the two group's infants in terms of the first and the fifth minute Apgar scores.

Conclusion:

Single intra-venous injection of two ml. (8mg.) of dexamethasone before induction of labour appears to shorten labor duration.

Recommendations:

1- Intra-venous injection of dexamethasone a dose of 2 ml. (8 mg) is a safe and effective dose for shorting labor duration.

2- Larger randomized controlled studies should be carried out for longer duration to reach the safest regimen of dexamethasone before induction of labor.

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