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# Effect of Intravenous Dexamethasone on Duration of Labour Induction in Post Term Primi Gravid Women

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## ABSTRACT

**Background:** A frequent obstetric practice known as induction of labour is carried out for both medical and non-medical reasons.

**Objective:** To investigate how intravenous dexamethasone affects post-term primigravid women's active phase duration and the time between labour induction and the beginning of the active phase.

**Patients and Methods:** This double blinded randomized, controlled study was conducted at tertiary care hospital at Ain Shams University Maternity Hospital from January 2022 till October 2022 and performed on total of 102 Primigravid post term pregnant women who underwent induction of labour.

**Results:** The study stated that the 1st and 2nd stages of labour took a statistically shorter amount of time in the Dexamethasone than in the Control group, however the 3rd stage of labour took a statistically non-significantly different amount of time in either group.

**Conclusion:** With no difference in the negative effects on the mother or the fetus, dexamethasone 8 mg IV appears to shorten labour time, improve cervix ripening, and accelerate labour induction. It also appears to shorten the time between the first and second stages of labour.

**Keywords:** Dexamethasone, Labour Induction, Primi Gravid Women.

## INTRODUCTION

Ripening the cervix beforehand makes labour induction easier and more efficient if the cervix is unfavourable. Numerous methods can be used to ripen the cervix for getting it steady for induction. One of these methods included the delivery of prostaglandins, along with mechanical ones including laminaria, (EASI), and stress on the cervix using a Foley catheter. One method advocated for speeding up the labour induction process is the use of corticosteroids [(1)].

The favoured approach for cervical ripening and labour induction continues to be prostaglandins. The uterus and cervix naturally manufacture prostaglandins, which function as mediators of cervical ripening. When exogenous prostaglandin preparations are administered, collagenase is activated, the extracellular matrix is remodelled, and uterine contractions are produced [(2)].

The United States FDA has given dinoprostone approval for cervical ripening and preparing the cervix for labour. It is offered by Ferring Pharmaceuticals Inc. in Parsippany, New Jersey, Pfizer Inc. in New York, USA, or Nabiqasim Pharmaceuticals Pakistan [(3)].

All four prostaglandin (EP) receptors are targeted by dinoprostone, which also activates EP1 and EP3 for increasing intracellular Ca while also stimulating EP [(2,4)] to enhance synthesis of (cAMP) [(3)].

Misoprostol, a synthetic counterpart of PGE1, is frequently used to treat postpartum hemorrhage, terminate pregnancies before 28 weeks of gestation, and treat cervical ripening. In order to avoid and treat gastrointestinal ulcers and PU, it has FDA approval in the United States. Although there are multiple routes of administration—oral, rectal, sublingual, and vaginal—absorption differs. It is sold under the brand names vagiprost from ADWIA Pharmaceuticals in Egypt, misotac 200 from SIGMA in Cairo, Egypt, and Cytotec 200 from Pfizer Inc. in New York, USA. To induce labour, the tablets are swallowed or inserted vaginally. 25-50 mcg IV every 6-8 hours and 25-100 mcg orally every 2-4 hours are the recommended dosages for inducing labour [(4)].

When using the injectable dexamethasone approach in 2003, **Ziaei and his coworkers** [(5)] proved that a shorter gap was found than in control group between labour induction and the active stage.

In 2008, **Kashanian and his colleagues** [(6)] conducted a study in which dexamethasone plus extra-amniotic saline infusion was prescribed in comparison to extra-amniotic saline infusion alone for ripening of cervix and induction of labour. They came to the conclusion that adding dexamethasone can reduce the time required for labour induction.

Numerous researches have examined the function of corticosteroids in the onset of labour since the discovery of glucocorticoid receptors in the human amnion [(4-7)].

It has been demonstrated that providing glucocorticoids to sheep fetuses increases premature delivery, despite the fact that the role of glucocorticoids during labour is not well understood. These findings have opened the door to discussions on the importance of corticosteroids in women's quicker inductions of labour. Trials have utilised both intravenous and extra-amniotic corticosteroids, and in some of these studies, both treatments have been effective [(7)].

This study looked into how intravenous dexamethasone affected active phase length and also the time between induction of labour and the start of the phase in post-term primigravid women.



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## PATIENTS AND METHODS

From January 2022 to October 2022, 102 primigravid post-term pregnant women who had labour induction participated in this double-blinded, randomized, controlled trial at the Ain Shams University Maternity Hospital, a tertiary care facility.

**Study population:**

Primigravid post term women who were pregnant and attended to Maternity Hospital in Ain Shams University.

**Inclusion criteria:**

The following conditions must be met: Primarily fertile, Singleton fetus, Cervix with a Bishop score of less than 6, Intact fetal membranes, Vertex presentation, and No contraindication to vaginal delivery. Gestational age (40–42 week) based on a reliable date for the last menstrual period, which was confirmed by a first-trimester ultrasound evaluation.

**Exclusion criteria:**

A previous caesarean section, placenta previa, intrauterine developmental retardation, and non-vertex presenting maternal diseases such severe pre-eclampsia and diabetes mellitus are a few examples of grounds for caesarean sections, Vaginal bleeding in prodigious proportions, Previa of the placenta, a high Bishop score, and a predicted foetal macrosomia of more than 4 kg, Patients who opted out of the study and mothers who experienced an amniotic sac spontaneous rupture.

**Sample size:**

Using the PASS II programme to calculate sample size and in accordance with **Laloha *et al.*** [7], the expected mean duration from induction until the active phase beginning in the study group was expected to be 2.87+1.57 hours (hr) and in the control group to be 3.8+1.72 hr. A sample size of 51 women per group was used for both groups' comparison, with eighty percent power and an alpha-error of 0.05.

**Study procedure:**

**Blinding:** This study was conducted without the volunteer or the researcher knowing the type of injection because the two selected injections cannot be discriminated from one another.

**Randomization:** Number codes ranging from 1 to 102 were sheeted on a graph and assigned to women who matched the criteria for admission. Then, using a computer system to select codes at random, each collection of codes was pooled to create groups for the test and control.

**Test Group**: included 51 patients who received dexamethasone sodium phosphate 8 mg (2 mL) intravenously (Dexamethasone ampoule, Amryia, Egypt) at least 30 minutes and up to 6 hours prior to the start of labour induction; the prostaglandin E1 analogue used for labour induction was vagiprost 25 mg given vaginally, ADWIA, EGYPT, over the course of 6 hours for 5 doses [8].

**Control Group**: included 51 patients who received 2 mL of saline intravenously at least 30 minutes and up to 6 hours prior to the start of labour induction.

**Methodology:**

**Each patient was subjected to:**

To rule out systemic illnesses, complete medical history was taken, congenital deformities of the foetus, and other reasons to avoid a vaginal delivery. A general examination was performed on the patients, which included measuring their BMI, bl pr, and pulse. Fetal site in uterus was determined by an abdominal examination that takes presentation, station of the fetal head, FHR, uterine contractions, and removal of multiple pregnancies into account [9]. A local examination is performed every four hours to look for cervical dilatation, effacement, presenting part, station of the fetus's head, positioning of the head, pelvic adequacy, and Bishop scoring (Table 1).

**Table (1):** Bishop score used to assess the inducibility [10].

| Parameter | Score | | | |
|---|---|---|---|---|
| | 0 | 1 | 2 | 3 |
| Cervical position | Posterior | Middle | Anterior | – |
| Cervical consistency | Firm | Medium | Soft | – |
| Cervical effacement | 0-30% | 40-50% | 60-70% | 80+% |
| Cervical dilation | Closed | 1–2 cm | 3–4 cm | 5+cm |
| Fetal station | −3 | −2 | −1, 0 | +1, +2 |

Every four hours, the mother temperature, pulse, blood pressure, randomly derived blood sugar levels, and other data were taken in order to monitor her health. Every 15 minutes, the health and heart rate of the fetus are monitored either continuously by an electronic monitor or intermittently using a Pinard stethoscope: CTG application for all cases before beginning the intervention for 30 min and after drug consumption in the first stage for 30 min while documenting the frequency, amplitude, and length of each contraction in the second stage.

According to **Zhang and Duan** [11], the active phase of the 1st stage of labour, which is indicated by the cervix's progressive dilatation, may not begin until the cervix has dilated 6 cm. The duration of the 2nd stage of labour was determined by counting the minutes between the full cervical dilation and the birth of the foetus. The duration of the 3rd stage was

documented. The APGAR score was used by neonatologists to evaluate newborns.

**Primary outcome**

The interval between induction starts and when labour enters the active phase. **Zhang and Duan [(11)]** stated that the active labour phase of the 1st stage, which is distinguished by an accelerated cervical dilation, may not begin until six cm dilatation).

**Secondary outcome**

The lengths of the 1st and 2nd stages, 3rd stage of labour length, the delivery method, The newborn prognosis was evaluated using the APGAR score, as well as postpartum complications such aberrant vital signs, infection, and hemorrhage following childbirth for the mother.

**Ethical approval:**

**The Ethics Committee of Ain Shams University's Faculty of Medicine granted the study approval. All participants signed an informing consent after a thorough explanation of the goals of the study. The Helsinki Declaration was followed throughout the study's conduct.**

***Statistical analysis***

The collected data were coded, tabulated, and statistically evaluated using SPSS statistics version 22.0. While descriptive statistics for qualitatively scattered data were calculated as number and percentage, they were calculated for quantitative normally distributed data as the minimum and maximum of the range, mean, and SD.

The Shapiro-Wilk test and the independent t-test were utilized in inferential investigations for quantitative variables with normally distributed data in cases of two independent groups. Using Fisher's Exact tests for variables with small anticipated numbers and chi square tests for proportional differences, inferential analysis for independent variables in qualitative data was carried out. $P<0.05$ was chosen as the significance level; data over this point were not taken into consideration.

**RESULTS**

Age, gestational age, and prior surgical history did not significantly differ between the Dexamethasone and the other group (Table 2).

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**Table (2):** Baseline characteristics in the groups

| Variables | | Dexamethasone (no=51) | Control (no=51) | p-value |
|---|---|---|---|---|
| **Age (years)** | **Mean±SD** | 21.4±3.5 | 22.2±3.0 | ^0.218 |
| | **Range** | 18.0–35.0 | 17.0–29.0 | |
| **Gestational age (no, %)** | **Week 40** | 37 (72.5%) | 40 (78.4%) | §0.646 |
| | **Week 41** | 13 (25.5%) | 11 (21.6%) | |
| | **Week 42** | 1 (2.0%) | 0 (0.0%) | |
| **History of previous surgery (no, %)** | **None** | 40 (78.4%) | 42 (82.4%) | §0.743 |
| | **Tonsillectomy** | 6 (11.8%) | 4 (7.8%) | |
| | **Appendectomy** | 2 (3.9%) | 1 (2.0%) | |
| | **Orthopedic** | 2 (3.9%) | 1 (2.0%) | |
| | **Others** | 1 (2.0%) | 3 (5.9%) | |

^Independent t-test. §Fisher's Exact test.

**Successful induction** was non-significantly more frequent in Dexamethasone group than Control group (Table 3).

**Table (3):** Fate of induction in the groups

| Result | Dexamethasone (no=51) | Control (no=51) | p-value | Relative rate (95% CI) |
|---|---|---|---|---|
| **Success** | 47 (92.2%) | 45 (88.2%) | #0.505 | 1.04 |
| **Failure** | 4 (7.8%) | 6 (11.8%) | | 0.92−1.19 |

#: Chi square test. CI: Confidence interval. Relative effect: Effect in Dexamethasone group relative to that in Control group.

**Vaginal delivery** had no more frequent significance in Dexamethasone group than Control group (Table 4).

**Table (4):** Mode of delivery among the studied groups

| Mode | Dexamethasone (no=51) | Control (no=51) | p-value | Relative rate (95% CI) |
|---|---|---|---|---|
| **Vaginal** | 47 (92.2%) | 45 (88.2%) | #0.505 | 1.04 |
| **Cesarean** | 4 (7.8%) | 6 (11.8%) | | 0.92−1.19 |

#: Chi square test. CI: Confidence interval. Relative effect: Effect in Dexamethasone group relative to that in Control group.

**Duration between initiations of induction until active labour phase** was statistically shorter in Dexamethasone group than the other group (Table 5).

**Table (5):** Hours between inductions and the active labour phase beginning

| Measurement | Dexamathasone (no=47) | Control (no=45) | p-value | Mean ±SE (95% CI) |
|---|---|---|---|---|
| **Mean±SD** | 4.4±3.1 | 6.4±3.8 | ^ | -2.0±0.7 |
| **Range** | 2–14 | 2–18 | **0.008*** | -3.4–-0.5 |

^: Independent t-test. SE: Standard error. CI: Confidence interval. *Significant.

The Dexamethasone group's first stage of labour lasted statistically significantly less time than the Control group did (Table 6).

**Table (6): A**mong the examined groups, the number of hours in the initial stage of labour

| Measurement | Dexamethasone (no=47) | Control (no=45) | p-value | Mean± SE (95% CI) |
|---|---|---|---|---|
| **Mean±SD** | 6.8±3.3 | 8.8±4.1 | ^ | -2.0±0.8 |
| **Range** | 1.5–17 | 3.5–20 | **0.013*** | -3.5–-0.4 |

^Independent t-test. SE: Standard error. CI: Confidence interval. *Significant.

**Duration of second stage of labour** was statistically shorter in Dexamethasone group than Control group (Table 7).

**Table (7):** Duration of second stage of labour (minutes) among the studied groups

| Measurement | Dexamethasone (no=47) | Control (no=45) | p-value | Mean± SE (95% CI) |
|---|---|---|---|---|
| **Mean±SD** | 28.1±5.2 | 33.5±6 | ^ | -5.4±1.2 |
| **Range** | 20–45 | 20–45 | **<0.001*** | -7.8–-3.1 |

^Independent t-test. SE: Standard error. CI: Confidence interval. *Significant.

**Duration of third stage of labour** showed **no** statistically significant difference between Dexamethasone group and Control group (Table 8).

**Table (8):** Duration of third stage of labour (minutes) among the studied groups

| Measurement | Dexamethasone (no=47) | Control (no=45) | p-value | Mean± SE (95% CI) |
|---|---|---|---|---|
| **Mean±SD** | 6.1±1.5 | 6.5±1.1 | ^0.150 | -0.3±0.3 |
| **Range** | 4.0–9.0 | 4.0–9.0 | | -0.9–0.2 |

^Independent t-test. SE: Standard error. CI: Confidence interval.

**Postpartum maternal outcomes** were statistically non-significantly different among Dexamethasone group and Control group. Only one case in Dexamethasone group (2%) had **postpartum hemorrhage (Table 9).**

**Table (9):** Postpartum maternal outcomes among the studied groups

| Outcomes | Dexamethasone (no=51) | Control (no=51) | p-value | Relative rate (95% CI) |
|---|---|---|---|---|
| **Hemorrhage** | 1 (2%) | 0 (0%) | §1.00 | NA |
| **Infection** | 0 (0%) | 0 (0%) | NA | NA |
| **Abnormal vital signs** | 0 (0%) | 0 (0%) | NA | NA |

NA: Not applicable. §: Fisher's Exact test. CI: Confidence interval. Relative effect: Effect in Dexamethasone group relative to that in Control group.

**Neonatal outcomes** were statistically non-significantly different among Dexamethasone group and Control group (Table 10).

**Table (10):** Neonatal outcomes among the studied groups

| Measurement | Dexamethasone (no=51) | Control (no=51) | p-value | Mean± SE (95% CI) |
|---|---|---|---|---|
| **APGAR score at one minute** | | | | |
| **Mean±SD** | 8.2±0.6 | 8.1±0.7 | ^0.440 | 0.1±0.1 |
| **Range** | 6–9 | 7–9 | | -0.2–0.3 |
| **APGAR score at five minutes** | | | | |
| **Mean±SD** | 9.8±0.4 | 9.7±0.5 | ^0.267 | 0.1±0.1 |
| **Range** | 8–10 | 8.0–10 | | -0.1–0.3 |
| **NICU admission** | | | | |
| **Admission** | 0 (0.0%) | 0 (0.0%) | NA | NA |

NA: Not applicable. ^: Independent t-test. CI: Confidence interval.

## DISCUSSION

After 150 patients were assessed for eligibility, 51 patients from each group were included in the study. 14 patients who were eligible for the research chose not to take part, 104 people were allocated at random to 102 patients, and 22 patients were disqualified from the study owing to exclusion rules.

The 102 primigravid post-term pregnant women who had labour induction made up the final data set for the studies.

In the current trial, there were no discernible differences in age, GA, or a history of past surgery between both groups.

**Regarding the outcome of induction**, our study's findings showed that vaginal birth and successful induction were non-statistically more common in the Dexamethasone group than in the Control group. The success rate of vaginal delivery was 47 in the Dexamethasone group and 45 in the Control group, with no statistically significant difference between them

Our research showed that in the Dexamethasone group compared to the Control group, the interval between the onset of an induction and the start of the active phase of labour was much shorter.

Dexamethasone was administered via IV drip infusion in numerous investigations to ascertain its effect on the length of labour induction; some of these studies agreed with our findings, while others did not. These findings are in line with those of past studies. **Ahmed *et al.*** [12] conducted a case-controlled trial study with 100 pregnant women who were admitted to the labour ward for labour induction in order to ascertain whether dexamethasone plays a role in reducing the amount of time between the beginning of labour induction and the beginning of the active labour phase in post-term pregnancy. Both the induction stage and the active stage Bishop scores were shown in the study to be higher.

These findings are consistent with those of earlier studies conducted by **Saleh Zaher *et al.*** [13]**,** who recruited 52 primiparous women for a randomised case-control study to examine the impact of intravenous dexamethasone administration on cervix preparation and the length of labour induction in term pregnancy. They found that the initial Bishop Score at assessment prior to intervention in the dexamethasone and control groups.

Because of this, the interval between the onset of labour induction and the commencement of the active phase was 90 min in the Dexamethasone group but 112.88 min in the control group, which was significantly different [13]**.**

These results were in line with a clinical trial by **Hajivandi *et al.*** [14] that involved 100 qualified nulliparous women who were between forty and forty-two weeks pregnant. In this study, the case group received 8 mg of dexamethasone intramuscularly 12 hours prior to induction, while the controls received two milliliters of normal saline at the same intervals, with a significant difference between the two groups regarding the mean-time interval between the induction and the onset of active phase in the case group (3.1±0.68 hours) and in the control group it was (4.2 ±3.1 hours). The researchers concluded that intramuscular dexamethasone shortens the time period between the induction and the onset of active phase.

This was in line with a study by **Kashanian *et al.*** [6] who looked at the impact of giving dexamethasone injection on the length of labour and discovered that the dexamethasone group's induction to active phase transition time was significantly shorter than the control group indicating that the dexamethasone administration was successful.

Our study findings revealed that the first and second stages of labour in the Dexamethasone group were statistically shorter than those in the Control group, while the 3rd stage of labour did not statistically differ between the Dexamethasone group and the Control group.

In line with our findings, **Saleh Zaher *et al.*** [13] observed that the 2nd stage of labour took significant lesser time in the dexamethasone group than in the control group.

These findings were in line with those of **Ahmed *et al.*** [12] who found that the induction-active, active-second, and induction-second durations were all shorter in the dexamethasone group compared to the saline group, but that the difference in rate of delivery was statistically significant only for the induction-active and induction-second durations.

This study is consistent with a previous one by **Laloha *et al.*** [7], who examined a total of 172 patients, 86 women in the experimental group who received IV dexamethasone infusions, and the same number of patients in the control group who received saline infusions. They discovered that the experimental group mean time from the beginning of induction to the beginning of the active phase was shorter than that other one, and they came to the conclusion that dexamethasone administration can improve cervical preparation and accelerate induction of labour. This last study suggests that dexamethasone prescription can help improve cervix preparation, hasten labour induction, and that dexamethasone may be used to hasten delivery and promote cervix preparation.

Our findings corroborated those of **Pahlavan *et al.*** [15], who investigated the effects of intramuscular (IM) dexamethasone therapy on prolonged latent labour phase and discovered that the 2nd labour stage took 35.4 11.6 minutes in the case group and 49.2 ±16.9 min in the other one, with a significant difference. The 2nd stage of labour took less time in the dexamethasone group than in the control group (22.23 ±16.09 min against 29.03 ± 15.32 min, P=0.01), according to research by **Kashanian *et al.*** [6].

In order to assess the impact of intramuscular dexamethasone injection on labour induction, **Ziaei *et al.*** [5] conducted a study. Women were given two IM injections of ten mg dexamethasone spread by 12 hr during the 41st week of pregnancy, and the following day, oxytocin induction was performed. Twenty-four hr after enrolment, the other one received nothing but iv oxytocin. This study found that the proportion of patients in the dexamethasone group who entered the active phase of labour was significantly higher in the study group than in the control group, that the time between labour induction and the onset of the active phase was significantly shorter in this group than in the other, and that the mean oxytocin dose was significantly lower in the study group.

In contrast to our findings, **Hajivandi *et al.*** [14] found that there was no significant difference in the case and control groups times from the start of the active stage and the beginning of the second stage of labour. Their study used a different method of dexamethasone injection, 8 milligrammes IM in a single dosage, and intravenous oxytocin twelve hours following dexamethasone injection, which may be the cause of this discrepancy. Additionally, their study included more patients than ours.

In terms of postpartum maternal outcomes, our study findings showed that there was no statistically significant discrepancy between both groups in terms of hemorrhage, infection, and abnormal vital signs. Postpartum hemorrhage was present in just one instance (two percent) in the Dexamethasone group.

These results are in agreement with previous literatures [1,12,16] who revealed that there was no significant discrepancy in terms of systolic BP and diastolic BP among studied groups with no reported postpartum hemorrhage.

In terms of neonatal outcomes, our study findings showed that there was no statistically significant difference between the Dexamethasone group and the Control group for APGAR scores at one and five min or for NICU admission.

These results are in accordance with earlier study by **Ahmed *et al.*** [12], who observed no significant variations in APGAR scores at one and five minutes, birth weight, or NICU admission between the dexamethasone and saline groups.

**Saleh Zaher *et al.*** [13] found no statistically significant discrepancy between case and control groups in the first and fifth minutes of APGAR scores, which is consistent with our findings. This was in line with the findings of **Laloha *et al.*** [7], who discovered that there was little difference between the case and control groups in the first- and fifth-minute APGAR score.

**The strength points of this study:**

The study's advantages include the use of a single tertiary care facility, the randomized controlled double-blind trial design, and the fact that no participants were lost to follow-up throughout the study period. It offered a secure method that promoted vaginal birth.

**The limitations of the study:**

It is important to draw attention to the research flaws, which include the study relatively smaller sample size when compared to earlier studies, the absence of a multicentric study, and the high likelihood of publication bias. Another flaw is the lack of other groups employing extra-embryonic saline infusion and IM injections, which may understate the study findings.

## CONCLUSION

As demonstrated by the current study, a 2 ml (eight milligrams) dexamethasone IV appears to shorten labour time and has the potential to improve cervix ripening and speed up labour induction by reducing the interval between the beginning of the active labour phase and labour induction as well as the interval between the 1st and 2nd stages of labour, with no difference in adverse effects on the mother or the fetus.

The current study can contribute to the body of knowledge and offer some guidance for future investigations that will establish the long-term effects of dexamethasone on induction and progression of labour using larger sample sizes and different delivery routes.

## REFERENCES


1. **Elmaraghy M, El Refaie T, Labib K *et al.* (2018):** Effect of intramuscular administration of dexamethasone on the duration of labor induction. Evidence Based Women's Health Journal, 8(4): 311-317.
2. **Alfirevic Z, Keeney E, Dowswell T *et al.* (2016):** Which method is best for the induction of labour? A systematic review, network meta-analysis and cost-effectiveness analysis. Health Technol Assess, 20(65): 551-584.
3. **Bakker R, Pierce S, Myers D (2017):** The role of prostaglandins El and E2, dinoprostone, and misoprostol in cervical ripening and the induction of labor: a mechanistic approach. Archives of Gynecology and Obstetrics, 296(2): 167-179.
4. **Stephenson M, Wing D (2015):** A novel misoprostol delivery system for induction of labor: clinical utility and patient considerations. Drug Design, Development and Therapy, 9: 2321-27.
5. **Ziaei S, Rosebehani N, Kazeminejad A *et al.* (2003):** The effects of intramuscular administration of corticosteroids on the induction of parturition. J Perinat Med., 31(2): 134-9.
6. **Kashanian M, Fekrat M, Naghghash S *et al.* (2008):** Evaluation of the effect of extra-amniotic normal saline infusion alone or in combination with dexamethasone for the induction of labor. Journal of Obstetrics and Gynaecology Research, 34(1): 47-50.

7. **Laloha F, Asiabar N, Barikani A *et al.* (2015):** Effect of intravenous dexamethasone on preparing the cervix and labor induction. Acta Medica Iranica, 53(9): 568-572.
8. **El-Sherbini M, Helal O, Zaki M *et al.* (2018):** The effect of intramuscular administration of dexamethasone alone or in combination with hyoscine butylbromide in shortening the duration of induced labor in primigravidas. The Medical Journal of Cairo University, 86: 2335-2340.
9. **Nahum G (2002):** Predicting fetal weight. Are Leopold's maneuvers still worth teaching to medical students and house staff? The Journal of Reproductive Medicine, 47(4): 271-278.
10. **Gonen R, Degani S, Ron A (1998):** Prediction of successful induction of labor: comparison of transvaginal ultrasonography and the Bishop score. European Journal of Ultrasound, 7(3): 183-187.
11. **Zhang J, Duan T (2018):** The physiologic pattern of normal labor progression. BJOG., 125(8): 955-955.
12. **Ahmed A, Deif O, El-Saftawy M (2019):** Potency of dexamethasone in labor induction. The Egyptian Journal of Hospital Medicine, 74(7): 1544-1551.
13. **Saleh Zaher T, Gharib M, El Saied A *et al.* (2021):** Role of dexamethazone on cervical ripening and induction of labor in term pregnancy. Zagazig University Medical Journal, 27(6): 1518-1523.
14. **Hajivandi L, Montazeri S, Iravani M *et al.* (2013):** Effect of intramuscular dexamethasone on onset of labor in postdate pregnancy. Journal of Babol University of Medical Sciences, 15(3): 24-29.
15. **Pahlavan Z, Barat S, Esmaeilzadeh S *et al.* (2017):** The effect of dexamethasone therapy on prolonged latent phase of labor: a randomized double-blind clinical trial. Caspian Journal of Reproductive Medicine, 3(1): 33-38.
16. **Abdel Latif E, Taha W, Ahmed A (2018):** Effect of intra-muscular administration of dexamethasone on the duration of induction of labor in primigravida full-term pregnancy. The Egyptian Journal of Hospital Medicine, 73(6): 6973-6982.