ORIGINAL RESEARCH

Fetomaternal outcome of postdated pregnancies and role of Dinoprostone in a tertiary care center of West Bengal

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ABSTRACT

Background: Postdated pregnancy is one of the most prevalent types of childbirth. A pregnancy is referred to as postdated if it lasts longer than 40 weeks. After 41 weeks, the fetus is more at risk for various conditions, including meconium aspiration, oligohydramnios, which increases the risk of cord compression, declining placental function, and increasing fetal weight. The main objective of the studywas to evaluate the fetomaternal outcome of postdated pregnancies and role of Dinoprostone gel in a tertiary care center of West Bengal. **Methods :** This prospective longitudinal observational study was conducted at BS Medical College, Deptt. of (G&O) from June 2020 to May 2021, among 446 low risk pregnant women with well established GA ≥ 40 weeks and carrying a single, live intrauterine fetus in cephalic presentation. In this study 220 patients were included in study groupand they were induced with Dinoprostone gel, maximum 3 such, after 41 0/7 weeks of pregnancy(**Study group)** and results were compared with expected management group up to 42 0/7 weeks in 226 patients (**Control Group**). Statistical data were analysed by using Microsoft Excel and SPSS V.20 software. **Results :** Baseline features were similar in both groups. Induction/admission to delivery interval was 16.246±19.20 hrs in dinoprostone group and 12.56±2.42 hrs in expectantmanagement group with p=0.026. Meconium stained liquor was 88 (40%) and 44 (19.47%) in Dinoprostone and expectant group, respectively, p= 0.000. Abnormal CTG, hyper stimulation ofuterus occurred in 24 (10.91%), 12 (5.45%) cases in Dinoprostone group and 10 (4.42%), 6 (2.65%) cases in expectant group, respectively. Vaginal delivery was 138 (62.73%) and cesarean section was 41 (37.27%) in Dinoprostone group, in comparison to expectant group it was 160 (70.79%) and 66 (29.20%), respectively. 5th min Agar's score and NICU admission was similar inboth groups. **Conclusion :** Early induction at 41 weeks and close antenatal monitoring up to 42 weeks show similar outcome in respect to mode of delivery, neonatal morbidity and maternal complications. Dinoprostone is very effectivefor labour induction but close monitoring is required for early diagnosis of uterine hyper stimulation and fetal heart rate changes.

Keywords: Dinoprostone, Fetomaternal outcome, Post dated pregnancy, Uterine hyper stimulation

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INTRODUCTION

Pregnancy beyond dates (expected date of delivery) is referred to by the World Health Organization (WHO) and the International Federation of Gynecology and Obstetrics as prolonged pregnancy, postdate pregnancy, postterm pregnancy, and postmaturity. A pregnancy that continues past 294 days or 42 weeks of gestation is classified as a postterm pregnancy (PTP)by the World Health Organization.[1] About 7% is the reported frequency of PTP.[2] The characteristics of the population and local management techniques affect the prevalence. Whether early pregnancy ultrasound examination is used to estimate gestational age or if the calculation is based solely on the history and clinical examination determines the incidence of PTP.[3,4] The "incidence" of PTP has decreased by 50.0% as a result of early ultrasound examinations used to assess gestational age.[5]

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There are different methods for management of the postdated pregnancy. Many obstetricians want expectant management up to 41 completed week followed by induction/cesarean section. Many obstetricians preferred early induction. There are different methods of labour induction. Commonly used agents for induction are oxytocin, PGE2 gel. Whatever may be the method, we should take the most appropriate measure to gain a healthy baby with healthy mother.

In the current study, we assessed the mode of delivery, neonatal morbidity, and maternal complications during post-dated pregnancy in relation to the fetomaternal outcome.

Pregnancies that occur after a certain date can have various causes. Although the precise cause of post-term pregnancy is unknown, certain risk factors, such as parity, maternal age, a history of post-term pregnancy in the past, genetics, and obesity, are linked to the condition.[6,7] Fetal surveillance for prolonged pregnancy, induction of labor, and appropriate monitoring of labor during intrapartum care are all part of the management protocol for post-term pregnancy.[8]

Post-dated pregnancies are associated with complications for both the mother and the fetus. There is a higher risk of oligohydramnios, meconium-stained amniotic fluid, macrosomia, fetal post maturity syndrome, and caesarean delivery in pregnancies that have gone past the anticipated date of delivery, according to reports. These conditions put both the mother and the unborn child in danger. Long-term pregnancies have traditionally been considered high-risk due to the known increase in perinatal morbidity and mortality.[9]

The aim of the present study was to evaluate the fetomaternal outcome of postdated pregnancies in a tertiary care center of West Bengal.

MATERIALS AND METHODS

Present hospital based prospective longitudinal observational study was conducted in the Dept of Gynae and Obstetrics, BS Medical College, Dept. of (G&O) from June 2020 to May 2021.

Total 446 low risk pregnant women with well established GA ≥ 40 weeks (USG done around 20 weeks) and carrying a single, live intrauterine fetus in cephalic presentation and who gives the consent for this study. When pregnancy is complicated by preeclampsia, eclampsia, heart disease, medical disorder, abnormal presentation and position, IUGR, post cesarean pregnancy, ante partum hemorrhage was excluded from the study. In this study 110 patients were included in Dinoprostone group and they were induced by 0.5 mg Dinoprostone gel, intracervically 4 hourly, maximum 3 such, after 41 0/7 weeks of pregnancy, irrespective of Bishop's score status (Study group). On the other hand, 113 women assigned to expectant management group were asked to keep daily fetal movement count, twice weekly NST and twice weekly USG estimation of amniotic fluid vol. until spontaneous onset of labour or until labour was induced with oxytocin and or amniotomy or cesarean section after 42 0/7 weeks (Control group). They were alternately allotted to Study group and control group. Induction of labour / cesarean section in expectant group was done if there is DFMC <10 in 12 hrs or abnormal NST or oligohydraminos (AFI <5) or after 42 0/7 weeks of gestation.

Labour is monitor with intermittent auscultation of fetal heart rate, partograph and CTG, if needed. Obstetric outcome and fetomaternal outcome were measured in the form of induction/ admission- delivery interval, mode of delivery, and need for oxytocin augmentation, labour complication, 5 min Apgar score, and NICU admission, intrauterine and neonatal death

METHOD OF DATA ANALYSIS PLAN

For statistical analysis data were entered into a Microsoft excel spread sheet and then analyzed by SPSS 20.0. A chi-squared test ($\chi 2$ test) was any statistical hypothesis test wherein the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. P-value ≤ 0.05 was considered for statistically significant

ETHICAL CONSIDERATIONS

Study was initiated after obtaining the informed consents from the participants and ethical clearance from the institutional ethical committee.

RESULTS

Table 1: Maternal baseline details (n=446)

Parameters	Dinoprostone gel n= 220	Expectant n=226	P value #
Mean age (yrs)	23.47±2.58	22.056±2.84	0.186
Parity Primipara Multipara	174 (79.09%) 46 (20.91%)	178 (78.76%) 48 (21.24%)	
Mean Gestational age (wks)	40.28 ± 0.85017	41.156±0.4386	0.00
Mean Cervical score prior to induction	3.88±0.682	4.67±4.38	0.00
Height (cms)	152.64±15.46	151.38±13.92	0.645
Weight (kgs)	52.13±20.24	52.89±12.94	0.42
BMI	23.82±1.18	22.44±2.36	0.05

Base line statistics which were similar in both groups. (Table 1)

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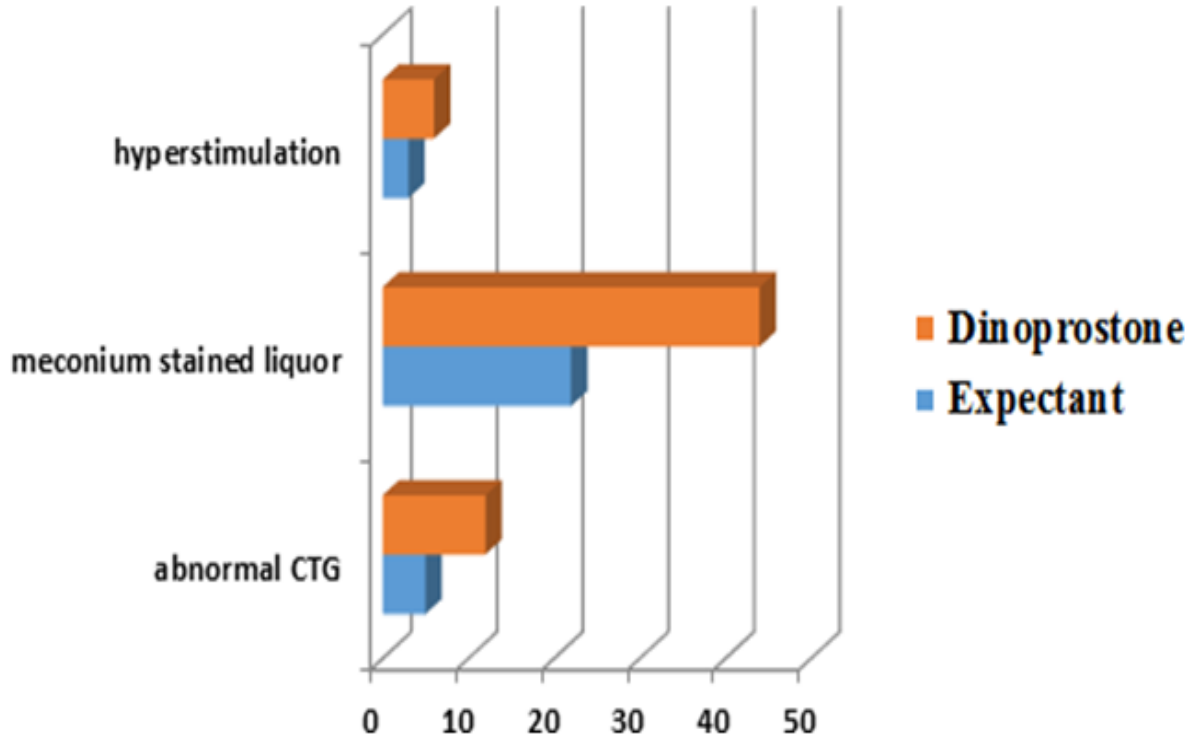
Table 2: Outcomes in labour

	Dinoprostone(n= 220)	**Expectant (n=226)**	**p value, #**
Abnormal CTG	24 (10.91%)	10 (4.42%)	0.058
Induction/admission todelivery interval(hrs)*	16.246±19.202	12.56±2.426	0.026
Meconium stained amnioticfluid	88 (40%)	44 (19.47%)	0.000
Augmentation with oxytocin	66 (30%)	100 (44.25%)	0.000
Hyperstimulation of uterus	12 (5.45%)	6 (2.65%)	0.314
Delivery mode(all subjects)	138 (62.73%)	160 (70.79%)	0.258
Vaginal Caesarean	82 (37.27%)	66 (29.20%)	0.264
Deliverymode (nulliparousonly)	104 (59.77%)	116 (65.17%)	0.542
VaginalForceps	4 (2.29%)	4 (2.25%)	0.892
caesarean	66 (37.93%)	58 (32.58%)	0.326

*'**Induction'** applicable for Dinoprostone group.
'**Admission'** to delivery interval applicable for expectant group.

Figure 1: Comparison of outcomes of labour between Dinoprostone and expectant group.



Induction/admission to delivery interval was 16.246±19.20 hrs in Dinoprostone group and 12.56±2.42 hrs in expectant management group with p=0.026. Meconium stained liquor was 88 (40%) and 44 (19.47%) in Dinoprostone and expectant group, respectively, P=0.000. Augmentation with oxytocin needed in 66 (30%) and 100 (44.25%) cases, with p=0.0001 in Dinoprostone and expectant group, respectively. Abnormal CTG, hyper stimulation of uterus occurred in 12 (5.45%), 12 (2.65%) cases in Dinoprostone group and 10 (4.42%), 6 (2.65%) casesin expectant group, respectively. (Table 2 and chart 1)

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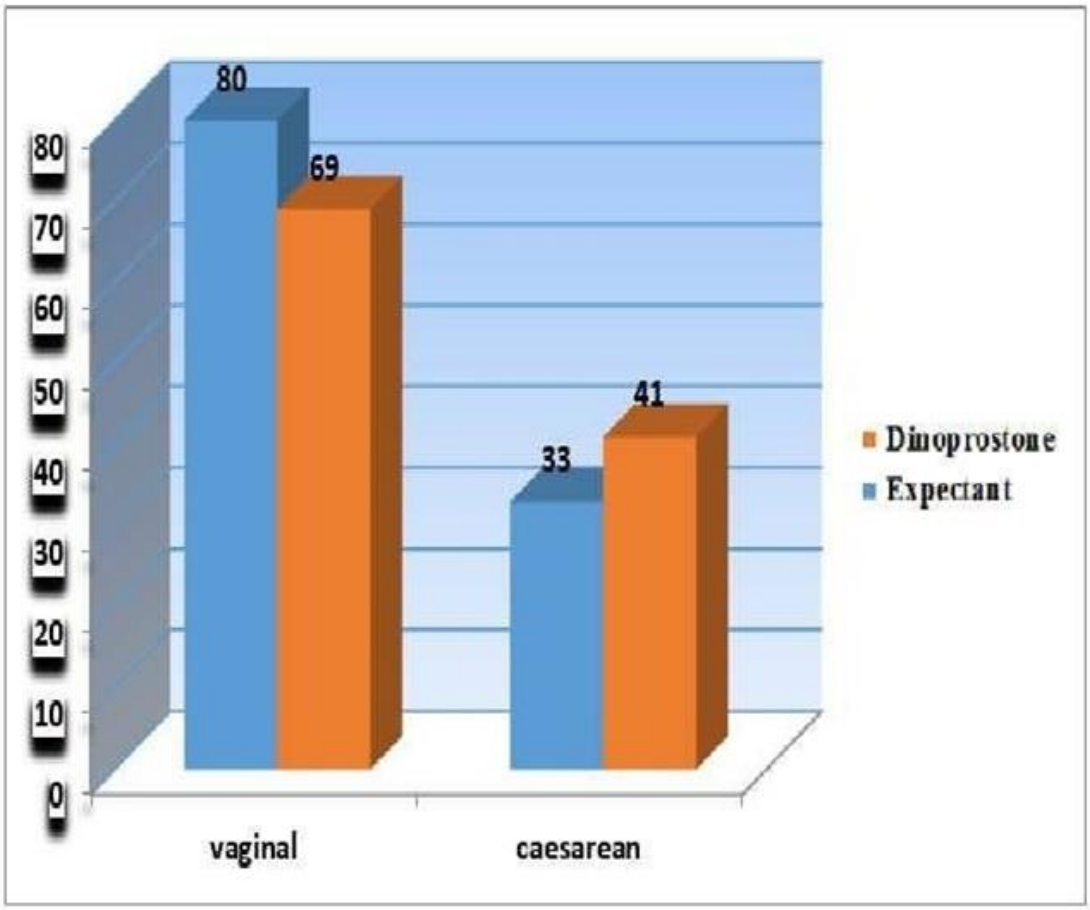
Figure 2: Showing comparative study between vaginal and caesarean section among Dinoprostone and expectant group.



Vaginal delivery was 1380 (62.73%) and cesarean section was 82 (37.27%) in Dinoprostone group, in comparison to expectant group it was 160 (70.79%) and 66 (29.20%), respectively. (Table 2 and chart 2)

Table 3: Dose of Dinoprostone required for vaginal delivery in induction group (n=202)

Dinoprostone gel	No. of vaginal delivery (%)
2	78 (38.62)
3	124 (61.38)

N.B - 20 patients spontaneously go into labour.

Table 3 shows 124 (61.38%) cases 3 doses of Dinoprostone gel required of vaginal delivery and 20 patients spontaneously goes into labour.

Table 4: Gestational age at delivery for the expectant group. n= 226

Gastational age(Day)	Induced	Spontaneous	Total
287 or earlier	06	18	24
288	04	20	24
289	02	30	32
290	08	26	34
291	04	30	34
292	06	24	30
293	02	18	20
294	18	10	28
Total	50	173	226

Table 4 shows of the 226 women assigned to continuous antenatal monitoring group, 32 were induced due to medical reasons (oligohydraminos, DFMC < 10, abnormal NST) before 42weeks, and 18 women were induced according to protocol at gestational day 294, rest of women spontaneously goes into labour.

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Table 5: Neonatal outcome

	Dinoprostone(n=220)	Expectant(n=226)	P value
Mean birth weight(kgs)	2.58±0.24	2.35±0.22	0.784
Apgar score at 5 min	8.36±0.6578	8.6±0.712	0.385
Neonatal admissions	24 (10.91%)	14 (6.19%)	0.254
Neonatal death	4 (1.81%)	2 (0.88%)	
Intrauterine death	2 (0.90%)	0	

Table 5 shows 5 min of Apgar score was comparable in both group and NICU admission was 24 (10.91%) in Dinoprostone group and 14 (6.19%) in expectant group with, p=0.254

DISCUSSION

ACOG stated that it is reasonable to start antenatal testing after 41 weeks. But many obstetricians will start fetal testing around 40 weeks and it should be done twice weekly. Options for evaluating the fetal wellbeing include daily fetal movement count (DFMC), non stress testing (NST), biophysical profile (BPP) and modified BPP (NST, amniotic fluid vol. estimation), contraction stress testing (CST) and combination of these modalities. No single method has been shown to be superior over combination testing.[10,11] Delivery should be effected if there is evidence of fetal compromise or oligohydramnios.[10,12] Oligohydramnios is stated when Amniotic Fluid Index (AFI)is <5 or single deepest vertical pocket is <3 cm.

There are different methods of labour induction. In addition to oxytocin there are non pharmacological method of labour induction such as striping of membrane, cervical mechanical dilation by foley catheter, manual nipple stimulation and amniotomy. In women presenting with very unfavorable cervix, prostaglandins are the best agent. Dinoprostone (PGE2) has proven for cervical ripening and labour induction. Another prostaglandin, Misoprostol (PGE1) has been shown to be an effective agent for cervical ripening and labour induction. It is cheap and stable atroom temperature but it is an off level drug. It should be use with caution. Hopefully in 2007, WHO expert committee includes the 25µg Misoprostol tablet in essential medicine list and these inclusions hopefully help us to use low dose Misoprostol tablet for labour induction.[13]

In the present study mean induction/admission to delivery interval was 16.246±19.20 hrs in Dinoprostone group and 12.56±2.42 hrs in expectant group, with p=0.026. Similar study by Danielian P et al,[14] stated that the mean induction delivery interval with vaginal Dinoprostone was 14.4 hrs.

Abnormal NST was in 24 (16.91%) vs. 10 (4.42%), meconium stained liquor was 88 (40%) vs. 44(19.47%) and hyper stimulation of uterus was 12 (5.45%) vs. 4 (2.65%) in Dinoprostone and expectant group, respectively. Similar study by Hofmeyr GJ et al,[15] shows vaginal Dinoprostone was associated increased uterine hyper stimulation both without fetal heart rate changes (RR-1.67, CI 1.30-2.14) and with associated fetal heart rate changes (RR- 1.45, CI 1.04-2.04). There was also increased meconium stained liquor (RR-1.38, CI 1.06-1.79). Sanchez-Ramos L et al,[16] Menticoglou SM et al,[17] show higher dose of Dinoprostone has been associated with increased risk of uterine trachysystole and hyper stimulation, leading to non reassuring fetal testing result. Ameta analysis of 38 trial with 7022 patients show uterine hyper stimulation with fetal heart rate changes and meconium stained liquor were more common with Dinoprostone group than control group, but there was no significant difference in perinatal mortality.[13]

Augmentation with oxytocin is required in 66 (30%) cases of Dinoprostone group and 100 (44.25%) cases in expectant group with p=0.0001. Study shows 138 (62.73%) vaginal and 82 (37.27%) cesarean section delivery occurs in Dinoprostone group. In comparison to control groupit was 160 (70.79%) and 66 (29.20%), respectively. A meta analysis of 19 trials of routine vs. selective labourinduction in post dated pregnancy found that routine induction after 41 weeks of pregnancy was associated with a lower rate of perinatal mortality (OR-0.2, CI 0.06-0.7) and no increased in cesarean section rate (OR-1.02, CI 0.75-1.38) [10,18-20]

Present study shows although there is significant chance meconium stained liquor in Dinoprostonegroup than expectant group (P= 0.0001), Apgar score at 5th min and neonatal admission were similar in both groups (P=>0.05). The study was corroborated with study done by Danielian P et al.[14] There was no adverse neonatal outcome associated with use of Dinoprostone.[13] There was no difference between vaginal Dinoprostone group and oxytocin group in terms of perinatal and maternal adverse outcome.[13]

CONCLUSIONS

Early induction at 41 weeks and close antenatal monitoring up to 42 weeks show similar outcome in respect to mode of delivery, neonatal morbidity and maternal complications in postdated pregnancies. Dinoprostone is very effective for labour induction. It is especially relevant for a country like ours where economic resources are scare and high temperature prevail throughout the year, but close monitoring is required for early diagnosis of uterine hyper stimulation and fetal heart rate changes.

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Ethical approval: The study was approved by the institutional ethics committee

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