

Outcome of medical induction of labour in postdated pregnancy

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Abstract

Induction of labour in postdated pregnancy is an important issue in modern obstetric practice. It might play a great role to reduce maternal and perinatal mortality and morbidity. The study aims to determine the outcome of medical induction of labour in postdated pregnancy. It is a cross sectional study carried out in the Department of Obstetrics and Gynaecology, Chittagong Medical College Hospital, Chattogram, Bangladesh from October 2018 to April 2019. In this study among primi gravida 40% patient had vaginal delivery & 60% needed caesarean section, whereas 90% multigravida patient delivered vaginally & 10% needed caesarean section. 48% patient had favourable cervix & induced by oxytocin and remaining 52% patient having unfavourable cervix induced by prostaglandin followed by oxytocin. 55% caesarean section was done for fetal distress and 45% for abnormal uterine action and maternal complication occurred in 28% patient. Among the delivered baby 80% were healthy and 16% were asphyxiated. Oxytocin was found most effective in case of favorable cervix and prostaglandin in unfavorable cervix.

Keywords: postdated pregnancy; oxytocin; misoprostol; bishop's score.

1. Introduction

Literally, any pregnancy which has passed beyond the expected date of delivery is called prolonged or postdated pregnancy. The incidence of postdate pregnancy is between 4-14% [1]. When pregnancy is prolonged beyond 42 weeks of gestation, perinatal mortality increases. At 41 weeks of gestation the rate is 9 per 1000 live births, and it continues to raise thereafter [2]. So, prolonged pregnancy is a subject of concern because of its known association with increased fetal morbidity & mortality [3]. Management of prolonged pregnancy beyond 40 weeks is based on accurate dating by last menstrual period, ultrasound evaluation, maternal & fetal condition, dimension of bony pelvis & cervical scoring. Within the obstetric community, study suggests that cervical ripening & labour induction after 40 weeks gestation leads to improved maternal & neonatal outcome [4].

It is well recognized that in case of unripe cervix, induction of labour may be difficult & is often unsuccessful. Nulliparous women with a poor cervical score have a caesarean section rate as high as 65% following formal induction of labour while the same is not true in nulliparous as well as multiparous women with a good cervical score [5]. Unfavorable cervix is determined as Bishop's score ≤ 5 . The use of agents to ripen the cervix prior to conventional methods of induction is now standard practice [6]. Various mechanical and pharmacological methods have been used to ripen the cervix before induction of labour to increase the success rate [7]. These include Oxytocin, Intracervical Foley's catheter, stripping of membranes, amniotomy, prostaglandin etc. Medical methods of induction include Oxytocin and Prostaglandins. Oxytocin is a synthetic preparation and widely used as intravenous infusion, advantages are wide availability, less systemic side effects,

major catastrophe is a rarity. The topical application of Prostaglandin E2 intravaginally in a viscous base is an effective, safe and highly acceptable method. Misoprostol, PGE1analogue, 50µg intravaginally, is found more effective for induction of labour [8]. The use of prostaglandin preparations with or without oxytocin infusion is widely recognized & accepted as a standard method of labour induction & has been shown to reduce induction time & the risk of failed induction [9].

Mata analyses of randomized controlled trails demonstrate that a policy of induction of labour for pregnancies at or beyond 41 weeks compared to expectant management of gestation is associated with fewer perinatal deaths [10]. Another study showed that there was no significant difference in caesarean section rate 36(18%) in induction group compared with 28(14%) in spontaneous labour [11]. They showed that routine induction of labour for pregnancy beyond EDD is safe, having no significant increase in caesarean section or fetal complications. So the policy of routine induction at or around 41 weeks may be advocated in developing countries in view of the uncertainty of further prolongation of pregnancy beyond 42 completed weeks [12].

Materials and Methods

The trial was conducted between October 2018 and April 2019 in the Department of Obstetrics and Gynaecology, Chittagong Medical College Hospital (CMCH), Chattogram, Bangladesh and included women with pregnancy beyond EDD upto 42 weeks without labour pain. The study included 50 patients admitted to inpatient Department of Obstetrics and Gynaecology. A detailed history was taken from each patient, all the patients were examined thoroughly and related information were recorded in the questionnaire. LMP and EDD were ascertained and confirmed by clinical

examination (SFH) and by USG. Examination and USG of early pregnancy were collected from previous record; associated complications were excluded from history, clinical examination and investigations. Assessment of fetal wellbeing was done by clinical assessment, detection of fetal movement, FHR (by stethoscope or Doppler) and volume of liquor.

Bishop's scoring was done to assess the cervical condition. Cases selected for medical induction with an intention of vaginal delivery were fully informed about the procedure and possible outcome of induction. Informed consent was taken from each patient, in majority of the cases induction was started early in the morning to get all available facilities of hospital in case of emergency situation. Methods of induction were selected according to Bishop's score and engagement of head.

When the cervical score was favorable and head was deeply engaged oxytocin drip was started. In cases with good cervical score but the head not engaged oxytocin drip was also started. When the cervix was not favorable, prostaglandin tablet was given in posterior fornix of vagina to make the cervix favorable. In both primi and multigravida patient first started with 25µg of Misoprostol and then repeat it 6 hourly. After the cervix become favorable oxytocin drip was started. The initial dilution was 2.5 iu of oxytocin in 500 ml of Hartman's solution and the drip was started at the rate of ten drops per minutes and the drop rate was increased by 5-10 drops every half hourly until there was effective uterine contraction (5 iu contractions per ten minutes, each contraction lasting for forty seconds) provided the foetal heart rate was within normal range (110-180 beats per minutes). In most of the cases patients responded by the time they were receiving 25-30 drops per minutes; in some cases drop rate had to be increased up to 40 drops and only in a few cases up to 60 drops per minutes. Foetal heart was monitored by ordinary stethoscope. All the cases were monitored by close and careful clinical observation and a patograph was maintained in each case. Labour and delivery were managed according to standard protocol; the condition of the baby at birth was determined by apgar score and managed accordingly. A well designed preformed data collection sheet in which data were collected from the patient during the study period.

Statistical Analysis

The collected data were checked, edited and coded. Data were entered by developing a programme on Epi-Info software. The entered data were analyzed using EPI-Info and SPSS programme.

Rationale

Management of prolonged pregnancy beyond 40 weeks is a subject of concern because of its known association with fetal morbidity and mortality [3]. Intrapartum fetal distress, meconium aspiration syndrome, fetal trauma & post maturity syndrome are common fetal complications. Placental insufficiency is thought to be associated with aging of the placenta; this is the basis for another fetal problem. Oligohydraamnions, which is more common in post term gestation, may lead to fetal compromise. The maternal risk usually relate to big fetal size which may results in traumatic vaginal delivery, instrumental delivery & increased

Incidence of operative delivery. So this presentstudy is aimed to evaluate the outcome of medical induction of labour and to compare different methods of medical induction in postdated pregnancy among the admitted patient of Chittagong Medical College Hospital.

Ethical consideration

Ethical clearances were obtained from a competent authority. Written consents were obtained from the subjects. The patients had the right to refuse to participate in the study.

Results

Table 1: Age distribution of the patients (n=50)

Age in year	Number of patients	%
< 20	10	20%
20-30	34	68%
> 30	6	12%
Mean ± SD	25.4 ± 4.32	

The above table shows that 68% of the patients were of age group 20-30 years and mean (±SD) was 25.4 ± 4.32 years.

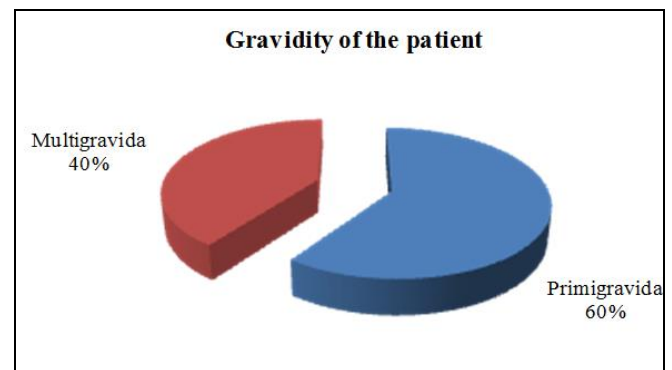


Fig 1: Gravidity of the patients

Figure I shows that 60% of the patients were primigravida and 40% were multigravida.

Table 2: Duration of pregnancy in the patients (n=50)

Duration of pregnancy (Week)	Number of patients	%
40 weeks completed (40-41wk) (280-287 days)	28	56%
41 weeks completed (41-42wk) (288-294 days)	22	44%

Table II shows that among the patients 56% came at 40-41weeks of Pregnancy and 44% came at 41-42 weeks of pregnancy.

Table 3: Procedure of calculation of E.D.D (n=50)

Procedure of diagnosis	Number of patients	%
By LMP with clinical assessment only	13	26%
By LMP with clinical assessments and confirmed by investigation (USG)	37	74%

Table III shows that E.D.D was calculated by LMP with clinical assessment only in 26% cases and by LMP with clinical assessment with was confirmed by investigation (USG) was in 74% cases.

Table 4: Pre-induction clinical findings (n=50)

Pre-induction clinical findings	Findings	Number of Patients	%
Engagement of head	Engaged	21	42%
	Not Engaged	29	58%
Bishop's score	0-5 (unfavorable cervix)	26	52%
	6-13 (favorable cervix)	24	48%

Table IV shows that out of study population 48% patients had favorable cervix and 52% patients had unfavorable cervix; 42% patients had engaged head and 58% patients had not engaged head during examination.

Cervix labour induction was given by oxytocin drip and in 52% patients with unfavourable cervix prostaglandin was used followed by oxytocin drip.

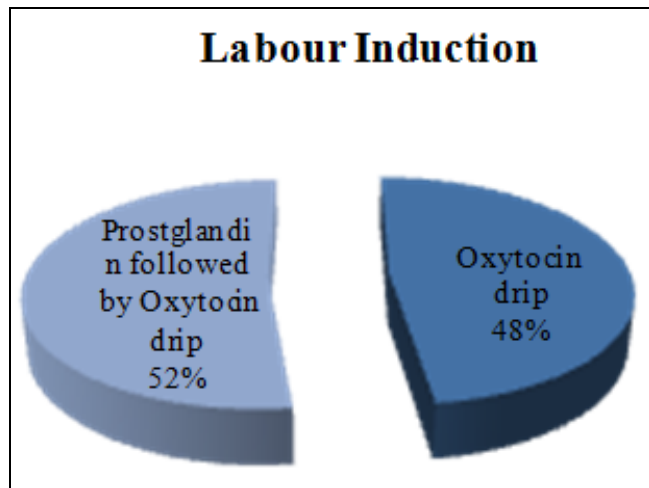


Fig 2: Methods of induction

Figure II shows that in 48% patients having favourable

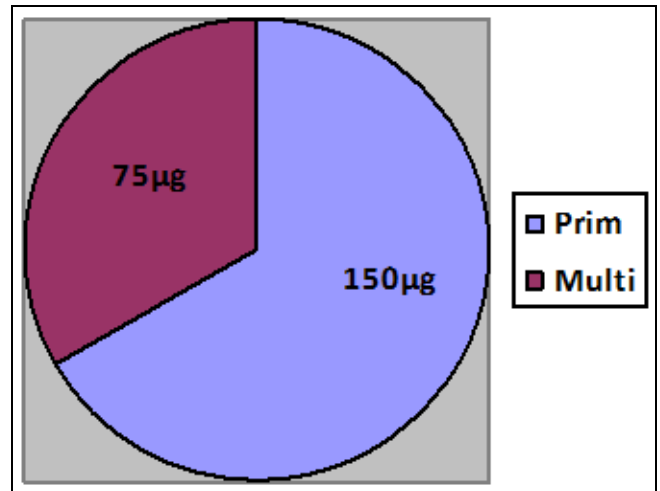


Fig 3: Mean dose of misoprostol for induction

Figure III shows that mean dose of misoprostol was 150µg in case of Primi gravida and 75µg in case of multi gravida.

Table 5: Outcome of induction in relation to cervix condition (n=50)

Mode of delivery	Induction given with unfavorable cervix Bishop's score 0-5	Induction given with favorable cervix Bishop's score 6-13	Total	P-Value
Vaginal delivery	12 (46%)	18 (75%)	30 (60%)	0.03751
Caesarean section	14 (54%)	6 (25%)	20 (40%)	
Total	26	24	50	

Table V shows that 75% patient of favorable cervix delivered vaginally and 25% needed cesarean section. 54% patients of unfavorable cervix needed cesarean section and 46% delivered vaginally. So mode of delivery significantly depends on cervical condition (P-value= 0.03751).

gravidia patient needs caesarean section for failed induction (p-value=0.1532). 55% patient of induction failure group developed fetal distress, labour prolonged in 20% patient and 25% patient were not responding (p-value=0.6726). 70% patient of induction failure was of prostaglandin group and 30% oxytocin group (p-value=0.0368).

Table 6: Characteristics of failed medical induction (n=20)

		Number	P-Value
Gravidity	Primigravida	18(90%)	0.1523
	Multigravida	2(10%)	
Pattern of failed induction	Not responding	5(25%)	0.6726
	Prolonged Labour	4(20%)	
	Fetal distress	11(55%)	
Methods of induction	Oxytocin drip	6(30%)	0.0368
	Prostaglandin with oxytocin drip	14(70%)	

Table VI shows that, 90% Primi Gravida and 10% multi

Table 7: Mode of delivery of the patients (n=50)

Mode of delivery	No. of patients	%
Normal Vaginal Delivery	24	48%
Instrumental delivery	6	12%
▪ Vacuum extraction	4	
▪ Forceps delivery	2	
Caesarean section	20	40%

Table VII shows that 48% patient delivered vaginally, 12% need assisted vaginal delivery and 40% patient needs caesarean section.

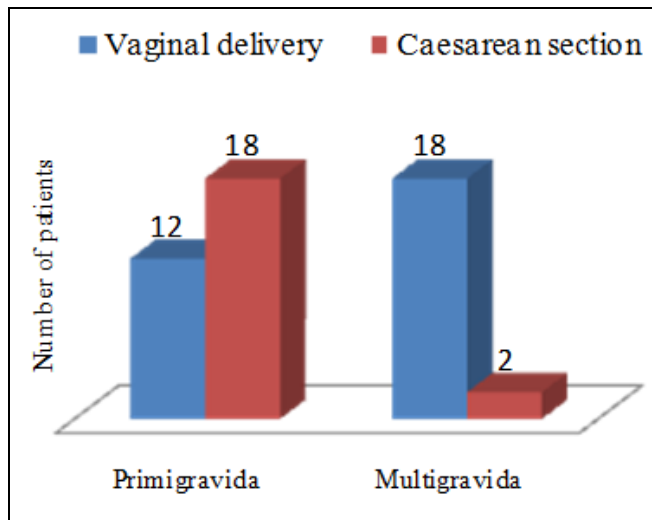


Fig 8: Mode of delivery in relation of Gravidity.

Figure IV shows that mode of delivery is significantly depends on gravidity of the patients (p-value=0.00041, Appendix-II C). Among primigravida 40% had vaginal delivery and 60% had caesarean section. Among multigravida 90% had vaginal delivery and 10% had caesarean section. So, success rate of induction is higher in multigravida than in primigravida.

Table 8: Indications of caesarean section (n=20)

Indication	Oxytocin Group	Prostaglandin Group	Total	%
Fetal distress	5	6	11	55%
Abnormal uterine action	4	5	9	45%
▪ Uterine inertia	3	2	5	
▪ Hyperstimulation	0	2	2	
▪ Cervical dystocia	1	1	2	

Table VIII shows that among the total numbers of caesarean section, 55% was done for foetal distress and 45% for abnormal uterine action and both were more in case of prostaglandin group.

Table 9: Maternal complication (Intrapartum / postpartum) (n=14)

Maternal complication	Oxytocin group	Prostaglandin group	Total	%
Abnormal uterine action	4	5	9	65
Cervical tear	0	1	1	7
Postpartum haemorrhage	1	1	2	14
Manual removal of placenta	0	0	0	0
Blood transfusion needed	0	2	2	14
Total	5	9	14	100

Table IX shows that 65% patient developed abnormal uterine action during labour and 7% patients had cervical tear. In 14% patients there was postpartum haemorrhage and needed blood transfusion.

Table 10: Neonatal condition at birth (n=50)

Foetal outcome	Number	%
Healthy baby	40	80
Asphyxiated baby	8	16
Still birth	0	0
Other complications LBW- 1 Birth trauma- 1	2	4

Table X shows 80% of the delivered baby was healthy, 16% asphyxiated and 4% has other complication like LBW and birth trauma.

Table 11: Foetal outcome according to duration of pregnancy (n=50)

Fetal outcome	Completed 40 weeks	Completed 41 Weeks	Total No. of Babies
Healthy baby	22	18	40 (80%)
Asphyxiated baby	2	6	8 (16%)
Other complications	2	0	2 (4%)
Total	26	24	50

Table XI shows that among the healthy babies majority (22) babies were born at 40 completed weeks and among the asphyxiated baby majority (6) were born at 41 completed weeks of gestation. 2 babies with other complications like LBW & birth trauma.

Discussion

Induction of labour was done by different methods and they were studied with analysis of various aspects of the cases in relation to the present study. Perinatal mortality and morbidity is increased in pregnancies over 41 weeks; but can be reduced by the induction of labour. Fetal jeopardy with continued intrauterine existence, as well as the excellent results of induction of labour justifies the active approach. Kaplan *et al* 1995 [13].

Previous study series concluded and established that active intervention reduces the rate of caesarean section^{14, 15}. In this study majority of the patients (68%) were between 20-30 years 12% are above 30 years. So incidence was higher in lower age group (Table-I).

In this study it was found that, there was increased occurrence of crossing E.D.D in primigravida (60%) than in multigravida (40%) (Fig: I). A study showed 68% women were in the age group of 20-30 years and 58% women were nullipara and 42% women were multipara¹⁶ which is quite similar with my study. In my study most of the patients presented with completed 40 plus weeks of gestation because they came in hospital for termination of pregnancy when their expected date of delivery over run. This may be due to increased awareness about morbidity of postdated pregnancy (Table-II).

A study showed that most of the pregnancies undergoing induction are not crossing E.D.D. when assessed by ultrasound dates¹⁷. They found that most of the pregnancies considered “postdated” according to menstrual dates are in fact misdated but in this study majority (74%) of the pregnancy crossing E.D.D. were confirmed by early USG and LMP combined, so the chance of misdate was low (Table III).

Regarding Bishop’s score, 52% women came with initial Bishop’s score about 0 - 5 and 48% women with 6 - 13. This finding correlates with the initial Bishop’s score of the study done by Castanede *et. al* 2005 [18]. (Table – IV). In this study, it is showed that in 24 patients labour induction were given by oxytocin drip. In 26 patients with unfavorable cervix prostaglandin was used and then followed but oxytocin drip (Figure- II).

In the present study patient with both favorable and unfavorable cervix were taken. The study showed better outcome in patient with favorable cervix, but in cases of unfavorable cervix the outcome is better than some previous

studies due to use of prostaglandins for cervical ripening. A similar study showed that 63% patient with unfavorable cervix required caesarean section after induction of labour and in their study no prostaglandins was used for cervical ripening [19]. Whereas in this study, because of prostaglandins, the caesarean section was only 30% and vaginal delivery was 60% in unfavorable cervix. The use of prostaglandins reduced the failure rate and increases the success rate in patients with unfavorable cervix. Here we have found that mode of delivery is significantly depends on cervix condition (p-value = 0.03751, Table-V). Table-VI shows the relation of induction failure to gravida and the type of induction given. Here more than 95% patients among failed induction cases were primigravida (p-value=0.1523), more than 50% patients developed fetal distress ((p-value=0.6726) and more than 50% were induced by prostaglandin with oxytocin drip (p-value=0.0368).

One of the controversial issues regarding management of pregnancy is whether routine induction of labour beyond expected date of delivery increases the rate of caesarean section. Most of the obstetricians in developed countries favor a conservative management (no induction) and they claim that induction increases the caesarian section rate. But the idea has been changed. A study showed that there was no significant difference in caesarean section rate 36 (18%) in induction group compared with 28 (14%) in spontaneous labour [11]. They showed that routine induction of labour for pregnancy beyond E.D.D. is safe; having no significant increase is caesarean section or fetal complications. So the policy of routine induction at or around 41 weeks may be advocated in developing countries, in view of the uncertainty of further prolongation of pregnancy beyond 42 completed weeks. Recent data also suggest that the risk of caesarean delivery after induction is lower than reported, possibly because of improvements in methods for cervical ripening (use of prostaglandins). Another study showed that most significant risk of non-progressive labour occurred after 42 completed weeks of gestation which in turn increases the caesarean section rate and to decrease this caesarean section rate they suggested for labour induction before 42 weeks [20]. In my study, it is found that due to routine induction of labour the rate of caesarean section was lower (Table-VII).

In this study it was found that due to routine induction of labour beyond expected date of delivery caesarean section rate was less in multigravida (10%), more in primigravida (60%) (Figure- IV). These results are comparable with similar study. In that study, among multigravida, induction of labour was associated with a significant reduction in incidence of caesarean section (from 22% in the control group to 11% in the induced group), for primigravida the difference was in opposite direction²¹. The evidence for multiparous women that induction of labour is associated with improved outcome of vaginal delivery. Here mode of delivery is significantly depends on gravidity (p - value = 0.00041).

If the causes of induction failure is analyzed, in the present study it is found that 55% caesarean section were done due to fetal distress and 45% were due to failure to progress as a result of abnormal uterine action (Table VIII) but according to several studies these indication of caesarean section are not potentially related to induction of labour. A study showed that the incidence of caesarean section for fetal distress is same in both induced and control group. More

over another study showed that risk factors intrinsic to the patient (nulliparity, cervical scoring, miscalculation) rather than labour induction itself, were the cause of higher caesarean delivery rate in prolonged pregnancy [22]. This was also reflected in the present study that caesarean section rate was higher in primigravida (60%) than multigravida (10%) so by reducing the risk factor a better outcome of induction can be achieved (Table VIII).

Regarding maternal complication PPH occur in 14% in this study (Table-IX) which is similar with the study conducted by Kenedy et. al. 1982 [23]. About neonatal outcome this study showed 80% baby born health. In a study, 36% babies were asphyxiated [24]. whereas in our study only 16% babies were asphyxiated. In every induction of labour every effort should be made so that maternal and fetal outcome is not affected (Table-X).

As antenatal fetal monitoring facilities is limited and patients compliance is very poor in our country, this study was designed to see the outcome of routine induction of labour in pregnancy beyond E.D.D. rather than continuing the pregnancy to have spontaneous labour which may increase the perinatal mortality and morbidity. If foetal outcome is considered in relation to gestational age, the study showed that the adverse outcome of pregnancy which crosses E.D.D. results in substantial increase in perinatal morbidity. Birth asphyxia or fetal hypoxia (meconium staining) was 75% in 41 completed weeks and 25% in 40 completed weeks (Table-XI).

This evidence of progressive increase of perinatal morbidity is supported by several studies. A study showed that rate of meconium stained amniotic fluid; abnormal foetal heart rate and macrosomia were found to be significantly higher with increasing gestational age [20]. They suggested routine induction before 42 weeks to reduce these fetal complications. Another study also showed that routine induction of labour in pregnancy which crosses E.D.D. may reduce the perinatal morbidity [25]. So we can say that routine induction of labour beyond E.D.D. but before 42 weeks is justified in our country, where patients compliance are poor and fetal condition and detection facilities are very much limited (Table-XI).

Conclusion

Pregnancy though is a physiological process, puts a woman and also whole family into tremendous anxiety, insecurity and uncertainty. When this special event is again over dated it means real pressure to the patient. For the obstetrician it is very important issue as they are to be concerned for the safety of both the mother and the baby. In view of the increased risk of obstetric and perinatal complications in which postdated pregnancy and the lack of consensus regarding clinical routine foetal surveillance and labour induction, the aim of this cross sectional study was to evaluate the obstetric and perinatal outcome of routine induction of labour in pregnancy beyond E.D.D. in the context of Bangladesh. In this study it is found that Oxytocin was found most effective in case of favorable cervix. In this case there are less chance of operative interference and more chance of vaginal delivery. Misoprostol was found to be more effective method in case of unfavorable cervix. The rate of operative interference was more in cases of primigravida with unfavorable cervix. The cause of caesarean section was mostly due to fetal distress and uterine inertia.

Recommendation

Women with post-dated gestations either undergo labor induction or to be managed expectantly. Prostaglandin can be used in post-dated pregnancies to promote cervical ripening and induce labor. Delivery should be affected if there is evidence of fetal compromise or prolonged labour. Management of prolonged pregnancy beyond 40 weeks need further study because of its known association with fetal morbidity and mortality.

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