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Original Research Article

Retrospective record based study of maternal and fetal outcome in induction of labour at 40 and 41 weeks of gestation in uncomplicated primigravida women

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ABSTRACT

Background: The objective of the study was to compare maternal and foetal outcome after induction in two groups: women who were induced at 40-weeks and at 41-weeks.
Methods: This was a retrospective study conducted over period of one year from 1 January 2018 to 31 December 2018 in the obstetrics and gynaecology department. A total of 200 uncomplicated primigravida women were included in the study. The data was collected and comparative analysis was done between two groups: control group (group A), women with induction at 40 weeks; study group (group B), women with induction at 41 weeks. The outcome was then analysed in terms of mode of delivery, oligohydramnios, meconium-stained liquor, Apgar score, need of NICU, perinatal death. The data was collected, analysed and statistical analysis was done using the Chi square test.
Results: Out of total 200 women, 104 women were of 40 weeks and 96 women had completed 41 weeks. The LSCS rate was reduced from 25.96% to 17.7%, when the labour was induced at 41 weeks, the instrumental delivery rate was low in the study group compared to the control group. Even though the meconium staining of liquor was high but NICU admission and perinatal mortality was comparatively lower in the study group.
Conclusions: Induction of labour done at 41weeks is associated with reduced maternal morbidity and no adverse effect on the perinatal outcome as compare to induction at 40 weeks.

Keywords: Induction of labour, Mode of delivery, Perinatal outcome

INTRODUCTION

Induction of labour is one of the most common procedures during pregnancy. Data from the National centre for health statistics for the last decade indicate that the rate of labour induction has increased gradually from 9% to 20%.

Indications for induction of labour have essentially not changed. When concern for the wellbeing of the mother arises, primary indications for induction include active medical disorders, being well beyond the due date and prolonged ruptured membranes. Indication is also justified when the foetus is at risk. Another general concept is the recognition that induction is associated with increased complications as compared with spontaneous labour. Complications include an increase of chorioamnionitis and increased caesarean delivery.

Increase in caesarean delivery rates associated with induction can be due to the uterus being poorly prepared

for labour and the physician's preferences regarding the duration of attempt at induction, especially in circumstances of the unripe cervix. The American college of obstetricians and gynaecologists practice bulletin induction of labour states, generally induction of labour has merit as a therapeutic option when the benefits of expeditious delivery outweigh the risks of continuing pregnancy. The benefit of labour induction must be weighed against the potential maternal or foetal risks associated with the procedure.

It has been shown that maternal complications of pregnancy could increase after 40 weeks gestation in low-risk women, especially primigravida.[2] In low-risk pregnancy at term, it has been suggested that active management of risk through the use of preventive labour induction prior to possible development of uteroplacental insufficiency or cephalo-pelvic disproportion can improve birth outcomes and reduce caesarean section rates.[3,4] Since women in Asia and Africa have been shown to have a shorter duration of pregnancy compared with European women the authors of this appraisal recommend that clinicians in those regions should regard recommendation no. 1 (IOL for women known with certainty to have reached 41 weeks of gestation) as strong.[5-7]

Maternal risks included emergency caesarean delivery, vacuum extraction or forceps delivery, cephalopelvic disproportion, cervical rupture, perineal lacerations, dystocia, large foetus, foetal death, postpartum haemorrhage. Neonatal risks were asphyxia, aspiration, admission to intensive care after birth, bone fracture, peripheral nerve paralysis and others.[8-10] In under-resourced settings where ultrasound scanning facilities were not available to date pregnancies accurately, there would be a need to educate and motivate pregnant women to attend prenatal clinics early to allow clinical dating of the pregnancy. On the other hand, there was no rationale for IOL. Further evidence was required regarding benefits and undesirable effects of IOL between 40 and 41 weeks.[3,4]

A policy of labour induction after 40 completed weeks or later, compared to awaiting spontaneous labour for at least one week (41 weeks) was associated with fewer perinatal deaths and meconium aspiration syndrome, without an increased risk of caesarean section (A).[11] Centres varied in the availability of tests for foetal surveillance and the ability to cope with the demand. Based on these factors, it was difficult to have a uniform policy for management of post term pregnancy. Considering the above literature, we have done a study to compare the effect of induction of labour at 40 weeks and 41 weeks. Objective of the study was to compare maternal and foetal outcome after induction in two groups: women who induced at 40-week group (40+0 to 40+6 days) and women who induced at 41-week group (41+0 to 41+6 days).

Herein this study we compared the pregnancy outcome of those intervened at forty weeks of gestation and those at forty-one weeks and thereby arriving at an optimum period for intervention in these pregnancies.

As many people in India lived in villages, with inadequate approach to health care facilities and also due to illiteracy, many women come to our hospital beyond 40 to 41 weeks of gestation. Such patients were included in one group for the purpose of study.

The problems associated with pregnancy that crossed expected days of delivery were 1.1: mother became anxious and feared any danger for the foetus; mother was at increased risk of operative delivery; foetus was at increased risk for post maturity, foetal distress, meconium-stained amniotic fluid, meconium aspiration syndrome, foetal heart rate abnormalities.

The objective of study was to study the maternal and foetal outcome of the uncomplicated primigravida women induced at 40th week and 41st week of gestation.

METHODS

The present study was a retrospective record-based study which was carried out in the obstetrics and gynaecology department, in Rajiv Gandhi medical college during the period from 1 January 2018 to 31 December 2018. A total of 200 uncomplicated primigravida women fulfilling the inclusion and exclusion criteria were included in the study.

The data was collected and comparative analysis was done in as following:

Control group (group A)

Uncomplicated primigravida women with 40 weeks of gestation for whom induction of labour was done.

Study group (group B)

Uncomplicated primigravida women with 41 weeks of gestation for whom induction of labour was done.

Inclusion criteria

Full term primigravida at 40 and 41 weeks, age group 18-45 years, pregnancies with reliable dates, previous regular menstrual cycles, gestational dating was confirmed by ultrasonography performed between 12-22 weeks of pregnancy were included in the study.

Exclusion criteria

Multigravida maternal age groups 44 years, unknown dates, irregular menstrual cycles, anomalous foetus, malpresentation, maternal complications like cephalopelvic disproportionate, pre-eclampsia, diabetes and cardiac diseases in pregnancy, women who reported in spontaneous labour were excluded.

Methodology

Ethical clearance was obtained from institutional ethics committee of Rajiv Gandhi medical college, Kalwa, Thane. Data was collected based on the inclusion criteria. Total 200 patients were included in study. The following outcome measures were analysed in both the groups: amount of AFI, incidence of meconium-stained liquor, mode of delivery, birth weight, Apgar score at birth, need for NICU admission, perinatal death.

Statistical analysis

The data collected in the study was entered in the computer using Microsoft excel 2013. Qualitative data was presented in the form of frequency and percentages.

The data was collected, analysed and comparison was done between the two groups. Statistical analyses were performed using statistical programs SPSS for Windows (version 20.1). All variables were analysed using the chi-square test. The p value less than 0.05 was considered as statistically significant.

RESULTS

Total number of women completed 40 weeks of gestation were 104 (52%) and those >41 weeks were 96 (48%) (Table 1).

Table 2 shows that there is no statistically significance in the amniotic fluid index in both study group and control group (p>0.05).

Table 1: Distribution of women according to the gestational age.

Distribution	Total
Control group (women with ≥40 weeks of gestation)	104
Study group (women with ≥41 weeks of gestation)	96
Total	200

Table 2: Association of amniotic fluid index in control and study group.

AFI	Control group	Study group
<5	2	1
5-8	12	13
8-10	65	52
>10	24	29
Polyhydramnios	1	1
Total	104	96

P=0.6, p>0.05, statistically not significant.

In the present study, 15.5% patients developed meconium-stained liquor in control group as compare to 20% patients in study group, but the difference was not significant (Table 3).

In the present study, the incidence of LSCS was 25% in control group and 17.7% in study group but the difference is statistically not significant (Table 4).

Table 3: Association of meconium-stained amniotic fluid in control and study group.

Weeks	Grade-I	Grade-II	Grade-III	Total	%
Control group	9	3	4	16	15.5
Study group	10	2	7	19	20

Student t test, p>0.05, not significant.

Table 4: Association of incidence of LSCS and vaginal delivery in study and control group.

Groups	LSCS	Vaginal delivery	Total
	N (%)	N (%)	
Control group (A)	27 (25)	77 (75)	104
Study group (B)	17 (17.7)	79 (84)	96
Total	44	156	200

P value is 1.96, p>0.05, not significant.

Table 5: To compare the statistical significance of instrumental delivery in A and B.

Groups	Instrumental delivery	Vaginal delivery	Total
	N (%)	N (%)	
Control group (A)	18 (23)	59 (77)	77
Study group (B)	7 (8.8)	72 (91.1)	79
Total	25	131	156

By Chi square test p<0.05 value significant.

Table 6: To compare the statistical significance of perinatal death in study and control group.

Groups	Perinatal death	Baby Alive	Total
	N (%)	N (%)	
Control group (A)	3 (2.8)	101 (97.1)	104
Study group (B)	2 (2.08)	94 (97.9)	96
Total	5	195	200

P=0.42, p>0.05, not significant.

Table 7: Association of birth weight in control and study group.

Birth weight (kgs)	Control group	Study group
<2	2	3
2-2.5	26	21
2.5-3.5	75	70
>3.5	1	2

By Chi square test p value >0.05.

Table 8: Association of perinatal outcome in study and control group.

Outcome	Control group	Study group	P value
	N (%)	N (%)	
NICU admission	12 (11.53)	8 (8.3)	<0.05
Apgar score <7	3 (2.8)	7 (7.2)	<0.05

By Chi square test p value less than 0.05.

The incidence of vaginal delivery was 75% in control group as compared to 84% in study group, but the difference is not significant.

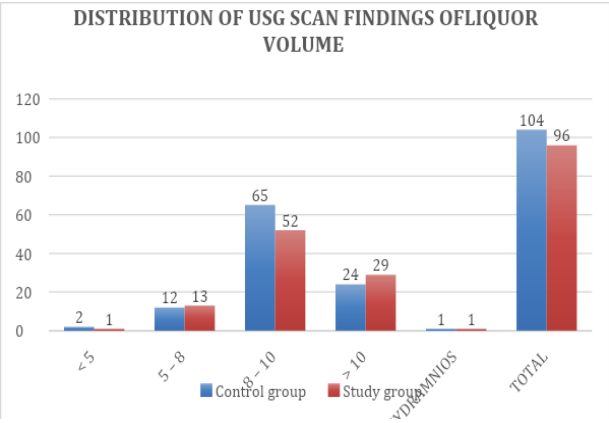

Figure 1: Distribution of USG scan findings of liquor volume.

The incidence of instrumental delivery when induction of labour done in control group was 23% which significantly differed from the study group which was 8.8% (Table 5).

Hence perinatal outcome in the form of mortality was 2.8% in control group as compared to 2.08% in study group but the difference was not statistically significant (Table 6).

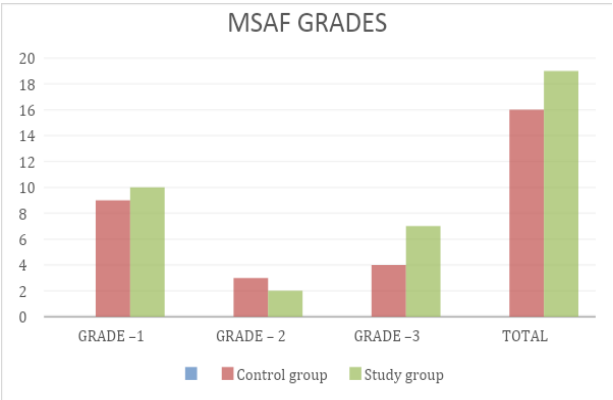

Figure 2: MSAF grades.

In the present study there was no statistically significant difference in the birth weight in control and study group (Table 7).

In present study, the need of NICU admission in control group was 11.53% as compared to 8.3% in study group, but the difference was not significant (Table 8).

The Apgar score <7 was seen in 2.8% patients in control group as compared to 7.2% in study group, but the difference was statistically not significant.

DISCUSSION

The study population consisted of 200 women who had gone beyond the expected date of confinement. Total

number of women completed 40 weeks of gestation were 104 (52%) and those >41 weeks were 96 (48%).

In the present study the incidence of oligohydramnios (AFI >8 cm) was 13.4% in control group as compared to 14.5% in study group.

In the present study, the incidence of meconium-stained liquor was 15.5% as compared to 20% in study group. The similar result was seen in Williams obstetrics where 21% of patients developed meconium-stained liquor at 40 weeks as compared to 25% at 41.[35] Similar results were seen in Steer et al and Miller et al 1981.[33,34]

In the present study, the incidence of LSCS was 25% in control group and 17.7% in study group but the difference was statistically not significant. Induction of labour after 41 weeks did not increase caesarean section rate.[15] This result was the same as that of review of meta-analysis of 12 trials involving 6,284 women, Henry et al, Katz et al, Suikkari et al, Augensen et al, Dyson et al, Bergsjo et al, Martin et al, Hannah et al, Herabutya et al and Rogers et al.[21-23,25,27-30,34,36,38] Perinatal outcome was not statistically significant from those induced at 41 weeks.

In the present study there was no statistically significant difference in the birth weight in control and study group. The incidence of macrosomia was 0.96% in control group and 2.3% in study group. The similar result was seen in Elden et al where the macrosomia was seen in 0.8% at 40 weeks and 2.8% at 41 weeks.[12]

In present study, the need of NICU admission in control group was 11.53% as compared to 8.3% in study group. Similar result was seen in Sanchez-Ramos et al where the NICU admission was 11.7% at 40 weeks as compared to 12.5% at 41 weeks.[39]

The Apgar score <7 was seen in 2.8% patients in control group as compared to 7.2% in study group. The result was comparable with Sanchez-Ramos et al where 1.1% showed Apgar <7 at 40 weeks and 1.4% at 41 weeks.[39]

In our study, perinatal outcome in the form of mortality was 2.8% in control group as compared to 2.08% in study group but the difference was not statistically significant.

Indian studies quoted perinatal mortality in 40 weeks and above as 14% and no difference in perinatal mortality at 40 and 41 weeks.[32] In our study also there was no statistical difference in PNMR between 40 weeks and 41 completed weeks.

Two randomised trials compared a policy of routine induction at 40 weeks Cole et al and Bergsjo et al against expectant management till 42 weeks gestation.[14,15] These trials revealed no evidence of any major benefit or risk to routine induction at 40 weeks. There was no effect on the caesarean section. But obviously, induction around 40 weeks reduced the incidence of meconium staining in the labour.

Limitation

The limitation of the present study was that the method of induction of labour used was not uniform for all patients in study and control groups.

CONCLUSION

Whenever a pregnant woman crosses her date of confinement, the patient becomes anxious and the obstetrician keeps the finger crossed. If the patient doesn't go into spontaneous labour, induction of labour becomes very important line of management in all post-dated pregnancies. After reaching the expected date of delivery how long to wait is question of debate. From the study conducted, we get the inference that the caesarean section rate is reduced from 25.96% to 17.7%, when the labour is induced at 41 weeks, one week beyond the expected date of confinement. Also, the instrumental delivery rate is low (7.3%) in the study group compared to the control group (17.26%). From the study we concluded that when the induction of labour is done at 41 weeks the chances of LSCS is reduced as compared to induction done at 40 weeks. Hence with close monitoring of progress of labour by maintaining partogram, foetal heart rate monitoring and if the liquor is clear, induction done at 41 weeks had more chances of delivering vaginally hence reducing the maternal morbidity and prolonged hospital stay. Even though the meconium staining of liquor is high in the study group (20% versus 15.5%), NICU admission and perinatal mortality is comparatively lower in the study group. From our study we concluded by we can safely wait with watchful expectancy till 41 weeks of gestation in all uncomplicated primigravida patients. So, the induction of labour in otherwise uncomplicated pregnancies, at 41 weeks is associated with reduced maternal morbidity and no adverse effect on the perinatal outcome.

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