

Rate of Failed Induction of Labour at 41 completed weeks or beyond at the Maternity Teaching Hospital

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Abstract— Objective: to identify the rate of failed induction of labour at 41 completed weeks and beyond at the Maternity Teaching Hospital in Erbil city and to find out the risk factors that lead to failed induction of labour at 41 completed weeks and beyond.

Method: This is a prospective observational simple descriptive study on women admitted for labour induction in Maternity Teaching Hospital in Erbil City from April 2015 to April 2016. V Induction was considered successful if the patient delivered vaginally and failed if it ended up in Caesarean Section.

Results: A total of 195 women were included in this study. 35.4 percent of our pregnant population who underwent induction of labour failed to deliver vaginally. 100% of 18 obese women failed induction of labour. 75% of 40 women with severe oligohydramneous and 41.7% of 96 nulliparous women had failed induction of labour.

Conclusion: Obesity, severe oligohydramneous and nulliparity had strongest association with failed Induction of Labour.

Index terms- Labour induction; 41 week gestation; Caesarean section; Failed induction.

I. INTRODUCTION

Induction of labor (IOL) is the planned initiation of labor prior to its spontaneous onset. Broadly speaking, an IOL is performed when the risks to the fetus and/or the mother of the pregnancy continuing outweigh those of bringing the pregnancy to an end. It should only be performed if there is a reasonable chance of success and if the risks of the process to the mother and/or fetus are acceptable. If either of these is not the case, a planned Caesarean section should be performed instead. (1)

Most common indication for IOL is prolonged pregnancy (previously described as post-term or post-dates). There is evidence that pregnancies extending beyond 42 weeks gestation are associated with a higher risk of stillbirth, fetal compromise in labor, meconium aspiration and mechanical problems at delivery. Because of this, women are usually recommended IOL between 41 and 42 weeks gestation. (1)

Until recently, most practitioners used the information obtained from a carefully taken history to calculate the expected period of confinement (37-42 week gestation). However, this approach proved inaccurate in the dating of up

to 60 per cent of pregnancies and meant that IOL for prolonged pregnancy was inappropriately timed. Consequently, the National Institute for Health and Clinical Excellence (NICE) and the national screening committee (NSC) recommend that pregnant women should be offered an early ultrasound scan between 10 weeks 0 days and 13 weeks 6 days to determine gestational age using a crown rump length measurement. Such an approach helps to reduce the anxiety experienced by many women they pass their expected date of delivery and also reduces the requests for early IOL. Where routine ultrasound dating is performed, less than 5 per cent of women will reach 42 weeks. However, women who have already experienced a prolonged pregnancy have a 30-40 per cent chance of doing so again. (2)

At 41 weeks gestation, approximately 19 per cent of women remain undelivered. This drops to 3.5 per cent at 42 weeks. The timing of induction will thus have critical workload implications. The NICE and Royal College of Obstetrics and Gynecology (RCOG) guidelines recommend offering induction beyond 41 weeks, but commencing further fetal surveillance at 42 weeks for women who do not wish induction. The later induction is performed in 41-42 week period, the fewer the number of inductions that will be needed. (3)

Induction of labor is most successful when the cervix is ripe at the time of labor induction. (4, 5)

In clinical practice the most commonly used assessment of cervical ripening is the Calder modification of the Bishop score. (5)

The recommended clinical practice in this area has been subject to a recent analysis comparing all the suitable controlled trials. It was concluded that IOL for gestations at or beyond 41 weeks (287 days) may reduce perinatal mortality and meconium aspiration syndrome and does not result in more caesarean deliveries when compared to expectant observational management, even among women whose cervix was not deemed to be favorable at the time of induction. (6)

However, it is important to remember that approximately 370 women will need to be induced to prevent a single stillbirth during this period of gestation. As such, a routine policy of offering an IOL for prolonged gestation may generate an increase in the workload within any individual unit without significantly reducing the observed perinatal mortality. (2)

II. AIM OF THE STUDY

To determine the rate of failed induction of labour at 41 completed weeks and beyond at the maternity Teaching Hospital in Erbil city.

Objectives:

1. To identify the rate of failed induction of labour at 41 completed weeks and beyond at the Maternity Teaching Hospital in Erbil city.
2. To find out the risk factors that lead to failed induction of labour at 41 completed weeks and beyond.

III. PATIENTS AND METHODS

Study Design: This is a prospective observational simple descriptive study that was conducted at the maternity Teaching hospital in Erbil city between April 2015 and April 2016. The study was carried out after approval of the Research Ethics Committee of the College of Medicine. Informed consent was obtained from all participants. Pregnant women who were admitted to the hospital with a diagnosis of prolonged pregnancy of 41 gestational weeks or beyond who underwent induction of labour were included in the study. The gestational age was calculated utilizing first trimester ultrasound.

Pregnant women with indications of induction of labour other than prolonged pregnancy were excluded from the study which were:

- Pre-eclampsia and other hypertensive maternal disorders.
- Fetal growth restriction
- Deteriorating maternal illness
- Pre labour rupture of membranes
- Unexplained ante partum hemorrhage
- Diabetes mellitus
- Twin pregnancy continuing beyond 38 weeks
- Intrahepatic cholestasis of pregnancy
- Maternal iso immunization against red cell antigen

A total of 195 patients fulfilled the inclusion criteria and were included in the study (table 1). Patients data were collected and included age, height, weight, Body Mass Index (BMI), smoking history, parity, gestational age by first trimester ultrasound, amniotic fluid index before starting induction, use of progesterone during pregnancy.

All patients were admitted to the labour ward. Induction was initiated by application of 25 mcg of Misoprestol inside the vagina every 4 hours to a maximum of 6 doses depending on the progress of labour such dilatation of cervix, Bishop score and uterine contractions. This is augmented by amniotomy and Oxytocin infusion. Induction was considered successful if the patient delivered vaginally and failed if it ended up in Caesarean section.

Data were analysed using SPSS version 19. Association of failed induction with age, Body Mass Index(BMI), parity,

IV. STATISTICAL ANALYSIS

The statistical package for social sciences program SPSS version 19 for data analysis was used. The results were analyzed using Frequency distribution, Chi square and P-value ≤ 0.05 was considered as statistically significant.

V. RESULTS

A total of 195 women were included in this study. Out of these 195 women, 69 had failed induction of labour giving a rate of 35.4%, and ended up in Caesarean section. The following factors were analyzed to see if they contribute to the risk of failed induction of labour. These factors were age, Body Mass Index (BMI), parity, smoking, amniotic fluid index, and gestational age.

Age range between 18 years and 41 years with a mean of 28.1 years. There was no statistically significant difference in the rate of failed induction of labour between the age groups with a P value of ($P \leq 0.974$),(table 2).

With regards to Body mass Index (BMI), there were 56 women with normal body weight and BMI, 121 women were overweight and 18 women were obese. Out of 56 women with normal body weight 19 (33.9) failed induction of labour, and out of 121 women with overweight 32 (26.4%) failed induction of labour. The difference between these two groups was not significant. While all 18 women who were obese failed induction of labour with a rate of 100%. This was statistically significant with a P value of ($P \leq 0.05$). Table 3.

Table 4 shows gestational age beyond 41 week by first trimester ultrasound. There was no statistically significant difference in the rate of failed induction of labour between different gestational age beyond 41 weeks with a P value($P \leq 0.2$).

Table 5 shows amniotic fluid index. There were 40 women with severe oligohydramneous, out of these 40 women 30 of them failed induction of labour with a rate of 75%. Comparing this group to the other groups of amniotic fluid index was statistically significant with a P value of ($P \leq 0.05$). Amniotic fluid index was a risk factor for failed induction of labour with women who have sever oligohydramneous having a high rate of failed induction compared to women with other score.

Table 6 shows smoking history. There was no difference in the rate of failed induction between women who smoke and non smo. Out of 40 women who smoked during pregnancy 13 (32.5%) failed induction of labour, and out of 155 women who did not smoke during pregnancy 56 (36.1%) failed induction of labour. This difference was not statistically significant with a P value of ($P \leq 0.669$).

Table 7 shows parity distribution. There were 96 nulliparous women, out of them 40 (41.7%) failed induction of labour. There were 99 multiparous women, out of them 29

(29.3%) failed induction of labour. The difference between these two groups was statistically significant with a P value of ($P \leq 0.049$).

VI. DISCUSSION

In this study 35.4 % of our pregnant women at 41 week or beyond failed induction of labour. We found that age, gestational age at 41 week or beyond, smoking history were not significant risk factors for failed induction of labour in our set of pregnant women at 41 weeks or beyond. In our study parity was a significant risk factor, other studies have shown induction of labour at term in nulliparous women is a risk factor for emergency Cesarean section.⁶ However in our study we only included women with 41 week gestation and beyond.

The onset of labour and delivery is an important determinant of maternal and perinatal outcome. Preterm and postterm births are associated with increased rates of perinatal morbidity and mortality than pregnancies delivered at term.

A meta analysis of 19 randomised trials (Cochran report 2006)⁷ showed that routine induction of labour at > 41 weeks of gestation to be associated with significantly lower rate of perinatal mortality than expectant management and no significant increase in the cesarean birth rate with induction at 41 week.⁷

In our study gestational age at 41 week or beyond did not show a significant increase in rate of cesarean section although in other study comparing gestational age showed that women with gestational age of more than 40 week have increased rate of cesarean section.⁶ However in our study we did not compare our group of pregnant women at 41 week and beyond to other women of less gestational age because we had a very select group of pregnant women.

We noted in our study that obese women have a very high rate of failure of induction of labour with 100% of them failed induction and went to cesarean section.

Since progesterone was not used during pregnancy in any women in our study, this was not analysed.

Tables and Charts

Table 1: Patients demographic data

	N	Minimum	Maximum	Mean	Std. Deviation
Age	195	18.00	41.00	28.1436	6.52512
Height	195	1.50	1.75	1.6148	.02748
Weight	195	56.00	90.00	68.7231	6.74156
BMI	195	21.55	33.53	26.3721	2.51269
Parity	195	.00	4.00	1.4256	1.54264
Valid N (listwise)	195				

Table 2: Age Group Emergency Caesarean Section

			Emergency caesarean section		Total
			Yes	No	
Age group	20<	Count	13	22	35
		% within Age group	37.1%	62.9%	100.0%
21-29	Count	25	44	69	
	% within Age group	36.2%	63.8%	100.0%	
30-39	Count	28	53	81	
	% within Age group	34.6%	65.4%	100.0%	
40-49	Count	3	7	10	
	% within Age group	30.0%	70.0%	100.0%	
Total	Count	69	126	195	
	% within Age group	35.4%	64.6%	100.0%	

Table 3: Body Mass Index (BMI)

			Emergency caesarean section		Total
			Yes	No	
BMI group	Normal weight	Count	19	37	56
		% within BMI group	33.9%	66.1%	100.0%
Overweight	Count	32	89	121	
	% within BMI group	26.4%	73.6%	100.0%	
Obese	Count	18	0	18	
	% within BMI group	100.0%	.0%	100.0%	
Total	Count	69	126	195	
	% within BMI group	35.4%	64.6%	100.0%	

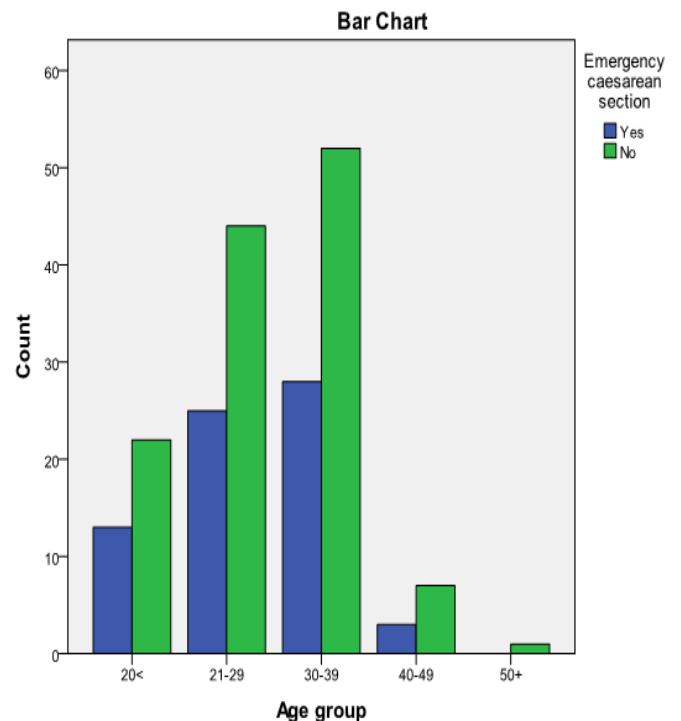


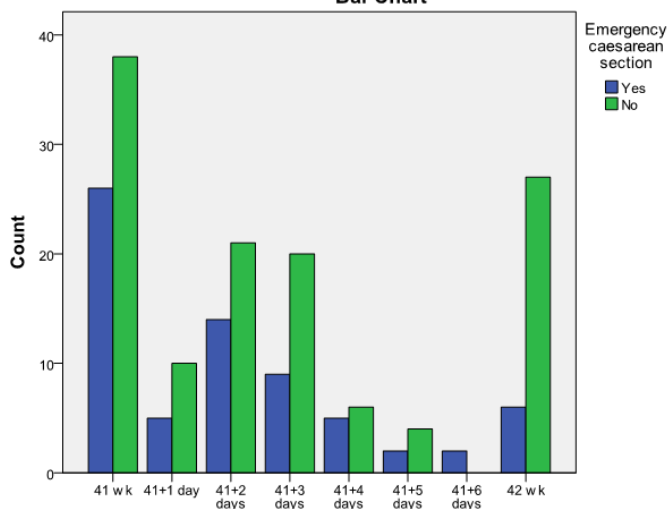
Table 4: Gestational Age

			Emergency caesarean section		Total
			Yes	No	
Gestational age by 1st trimester	41 wk	Count	26	38	64
		% within Gestational age by 1st trimester	40.6%	59.4%	100.0%
	41+1 day	Count	5	10	15
		% within Gestational age by 1st trimester	33.3%	66.7%	100.0%
	41+2 days	Count	14	21	35
		% within Gestational age by 1st trimester	40.0%	60.0%	100.0%
	41+3 days	Count	9	20	29
		% within Gestational age by 1st trimester	31.0%	69.0%	100.0%
	41+4 days	Count	5	6	11
		% within Gestational age by 1st trimester	45.5%	54.5%	100.0%
41+5 days	Count	2	4	6	
	% within Gestational age by 1st trimester	33.3%	66.7%	100.0%	
41+6 days	Count	2	0	2	
	% within Gestational age by 1st trimester	100.0%	.0%	100.0%	
42 wk	Count	6	27	33	
	% within Gestational age by 1st trimester	18.2%	81.8%	100.0%	
Total	Count	69	126	195	
	% within Gestational age by 1st trimester	35.4%	64.6%	100.0%	

Table 5: Amniotic Fluid Index

			Emergency caesarean section		Total
			Yes	No	
Amniotic fluid index before starting induction	Adequate	Count	12	18	30
		% within Amniotic fluid index before starting induction	40.0%	60.0%	100.0%
	Mild	Count	5	55	60
		% within Amniotic fluid index before starting induction	8.3%	91.7%	100.0%
	Moderate	Count	22	43	65
		% within Amniotic fluid index before starting induction	33.8%	66.2%	100.0%
	Severe	Count	30	10	40
		% within Amniotic fluid index before starting induction	75.0%	25.0%	100.0%
Total		Count	69	126	195
		% within Amniotic fluid index before starting induction	35.4%	64.6%	100.0%

Bar Chart



Gestational age by 1st trimester

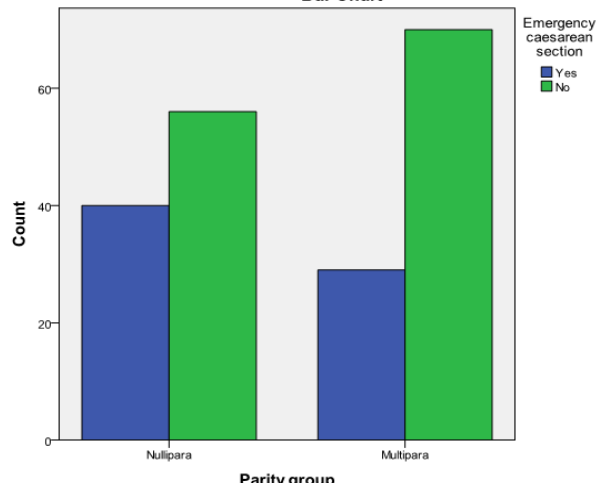
Table 5: Smoking History

			Emergency caesarean section		Total
			Yes	No	
Smoking	Yes	Count	13	27	40
		% within Smoking	32.5%	67.5%	100.0%
	No	Count	56	99	155
		% within Smoking	36.1%	63.9%	100.0%
Total		Count	69	126	195
		% within Smoking	35.4%	64.6%	100.0%

Table 6: Parity Group Emergency Caesarean Section

			Emergency caesarean section		Total
			Yes	No	
Parity group	Nullipara	Count	40	56	96
		% within Parity group	41.7%	58.3%	100.0%
	Multipara	Count	29	70	99
		% within Parity group	29.3%	70.7%	100.0%
Total		Count	69	126	195
		% within Parity group	35.4%	64.6%	100.0%

Bar Chart



Conclusions

In conclusion women at 41 week gestation or beyond who underwent induction of labour had 35.4 % rate of failure of induction. Nulliparity, Obesity and sever oligohydramneous are significant risk factors for failed induction of labour. Age, smoking, and gestational age were not significant factors for failed induction of labour in this specific group of pregnant women.

CONFLICTS OF INTEREST

The authors report no conflicts of interest.

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