Twin gestation: Is induction of labor possible in highly selected cases?

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ABSTRACT

Induction of labor has been in practice for several decades but the decision to induce labor in multifetal gestations has not been accepted by many practitioners in contemporary obstetrics. The aim of this study was to compare maternal and fetal outcomes among women with uncomplicated twin gestations who were induced at term and those who were not. It was a cross-sectional analytic study that lasted ten years, (1st January 2000 to 31st December 2009 inclusive) at the maternity of the central hospital, Yaounde, Cameroon. 158 women were enrolled, 79 were induced and 79 went into labor spontaneously. Maternal and fetal outcomes, duration of labor, the prevalence of caesarean section were compared in the two groups. The average age of the women in the groups was 26, 75 ± 3.65 years (range 15 - 41 years). For those who were induced, indication was premature rupture of membranes in 44 (56%) of cases. The characteristics of induced and none induced women were similar, except for the number of antenatal consultations (P ≤ 0.001). There was a significant difference in the duration of labor in the two groups (6 hrs versus 9, 75 hrs; P ≤ 0.001). The overall rate of vaginal delivery in the two groups was 87, 97% (n = 139), 88.87% in the group that was induced versus 86.07% in the group that labor was spontaneous (OR 1, 22; 95% IC 0, 51-2, 92; P ≤ 0.90). With respect to primary outcomes, there were no statistically significant differences between the group that labor was induced and that which labor was spontaneous. The prevalence of caesarean delivery was similar in the two groups (10%, 12% vs 13%, 92%; OR 0%, 7%; 95% IC 0, 27-1, 85; P ≤ 0.50). The main indications for caesarean section were acute fetal distress and failed induction. The first and fifth minute APGAR scores less than 7 in the first twins delivered in the two groups were similar. The 312 children delivered in both arms did not show any complications at birth. However, there were 3 neonatal deaths (1 vs 2). There were no cases of uterine rupture or maternal deaths among the 156 women. Induction of labor may be proposed to women with uncomplicated term twin gestations with specific indications. Induction in these highly selected cases does not impute any additional risks but close monitoring of labor is very necessary.

Keywords: Induction; Twins; Rupture

1. INTRODUCTION

Induction of labor denotes artificial provision of uterine contractions for reasons that may be related to the fetus or to the pregnant woman with the intention to deliver the feto-placental unit [1-3]. Induction is usually programmed at term, at post term or remote from term [3,4]. Rates of induction vary depending on the norms and procedures elaborated by each health facility but these rates tend to be on the increase nowadays [5-7]. Some important aspects to evaluate before induction are the state of the cervix, fetal weight and the bony pelvis. Specific paraclinical assessment of the cervix by cervicotonometry that measures the distensibility of the cervix now exist but simple evaluation using Bishop's score still has a place in our daily practice [5,6,8]. Indications for induction have been of old and have not shown significant variation. Obstetric indications include premature rupture of membranes (PROM), intrauterine fetal demise, post term, placental abruption among many others that

are part of our daily practice. Induction has also been carried out for medical reasons such as diabetes mellitus and hypertensive disorders [9-14]. In our context, induction may follow the request made by the woman, her husband or family. This approach is in practice in some developed countries [14]. Contraindications to induction group all contraindications to normal vaginal delivery but may be related also to the techniques used. Methods of induction in a typical developing world setting like ours are juxtaposed, beginning from mechanical induction using large capacity Foley's catheters or laminaria tents, to surgical induction by amniotomy, membrane sweeping and to medical induction using oxytocin or prostaglandins or a combination of two or all these indications [15-20]. It is common practice to begin with one method and progress to a combination of methods. Maternal and fetal monitoring is very important all through induction irrespective of the method used or grade or technical level of the maternity where induction is being carried out [21-23].

For several decades, only singleton pregnancies have been induced. In our daily practice, the decision to induce twin gestations has not been accepted by many and a review of the relevant literature does not give us sufficient data to support those who are for or those who are against. Up to date, studies on the subject have mitigating conclusions [9-23]. However induction in highly selected cases of twin gestations may not be specifically disadvantageous to mothers nor their fetuses.

2. OBJECTIVES

This study was designed to evaluate maternal and fetal outcomes in highly selected cases of twin gestations where labor was induced based on the hypothesis that labor may be the same as in none induced cases that exhibit similar characteristics and are in the same environment.

3. POPULATION AND METHODS

It was a cross-sectional analytic study that lasted ten years (1/1/2000-31/12/2009) at the maternity of the Yaounde Central Hospital, Cameroon. Included were all consented cases of uncomplicated twin gestations received during the study period with or without indications for induction at term (37 - 42 completed weeks) and with the first fetus in vertex presentation. 79 of them who presented with indications for induction were considered those with risk factors and the comparative group was made up of an equal number of women with similar characteristics who went into labor spontaneously. They were matched for age gravidity and parity.

Complete clinical evaluation was carried out in all the cases. For those who were induced; we used 5 IU of oxytocin (Syntocinon®) in 500 ml of 5% glucose inserted through one of the large veins in the left fore-arm using a large bore intravenous catheter. We started induction at 10 drops per minute and increased by 5 drops every 30 minutes until there were good contractions (3 contractions every 10 minutes lasting 40 - 45 seconds). For both groups, vital signs, fetal heart tones and uterine contractions were recorded every thirty minutes and vaginal examination every two hours. These recordings were transferred to the partogram when cervical dilatation was four centimeters and monitoring on the partogram continued until delivery. After delivery of the first twin, we carried out Leopold's maneuvers to be able to detect the position and lie of the second twin and if presentation of the latter was vertex or breech, we ruptured the membranes and allowed labor to progress. When it was breech, we applied Mauriceau or Bracht methods for the aftercoming head following Lovset's maneuvers. If the second twin was transverse, we performed podalic version and breech extraction. The third stage of labor was managed actively.

3.1. Variables Compared

Maternal variables were parity, gravidity, duration of labor, rate of vaginal delivery, the prevalence of caesarean section, post-partum hemorrhage, uterine rupture, cervical tear. Fetal variables were acute fetal distress, first and fifth minute Apgar scores and fetal demise.

3.2. Statistical Analysis

Sample size estimation was based on the hypothesis that normal delivery of twin gestations will reduce the rate of caesarean deliveries by 50% ($P_0 = 50\% \times P_1$). We collected data using a questionnaire that was conceived, pretested, corrected and adapted for the study. Epi Info 6.04 and Excel 2010 were used for analysis. With 1 induced to 1 none induced case, a period of ten years was required to recruit 156 cases needed to provide at least 90% power for a two sided test that would detect a change when the two groups were compared. Associations were compared using Chi Square test with Yates correction as applicable for smaller sample sizes. Based on Woolf's method, we calculated Odd Ratio with 95% confidence intervals (95% CI) to measure the effect of induction on variables

4. RESULTS

Women in their second and fifth pregnancies were more represented as reported in **Table 1** but this difference was not statistically significant (OR 1.64; 95% IC 0.86 - 3.66; P = 0.20). Fifty (63.29%) women in the group that was induced had more than four antenatal consultations as

Table 1. Comparison of characteristics of induced versus none induced women.

Characteristics	Induced	None induced	OR	95% IC	X²	P
Gravidity 2 - 5	55	46	1.64	0.86 - 3.66	2.22	≤0.20
Gravidity > 5	14	22	0.56	0.26 - 0.12	2.3	≤0.20
Parity 2 - 5	63	60	1.25	0.59 - 2.65	0.33	≤0.90
Parity > 5	11	7	1.66	0.61 - 4.53	1	≤0.50
Gestational age 37 - 40 SA	76	72	2.46	0.61 - 9.88	1.71	≤0.20
Gestational age > 40 SA	3	7	0.41	0.1 - 1.65	1.71	≤0.20
ANC ≤ 4	29	42	0.51	0.27 - 0.96	4.32	≤0.05
ANC > 4	50	27	3.32	1.73 - 6.37	13.4	≤0.001
Duration of labor 4 - 8	59	21	8.15	4 - 16.6	36.56	≤0.001
Duration of labor > 8 heures	20	58	0.12	0.06 - 0.24	36.56	≤0.001
Normal vaginal delivery	68	66	1.22	0.51 - 2.92	0.16	≤0.90
No maternal complications	64	62	1.77	0.54 - 2.55	0.16	≤0.90

against 27 (34.18%) in the group that went into spontaneous labor (OR 3, 32; 95% IC 1, 73-6, 37; P = 0.001).

Majority of the women (n = 59 or 74.68%) who were induced had shorter duration of labor (4 - 8 hours) as against 21 women (26.58%) in the second group and this difference was statistically significant (OR 8, 15; 95% IC 4-16, 6; P = 0.001). When duration of labor was greater than 8 hours, women in the group that was not induced was more represented (P ≤ 0.001).

Table 2 describes maternal and fetal complications that appeared in equal proportions.

5. DISCUSSION

Maternal and fetal outcomes were evaluated in selected cases of uncomplicated twin gestations with specific indications for induction of labor. These outcomes were matched against uncomplicated twin gestations where labor occurred spontaneously.

Outcome measures that were compared were obstetric characteristics such as gravidity, parity, gestational age at induction, number of antenatal consultations, duration of labor, and mode of delivery. Maternal and fetal complications were also compared.

A total of 158 women were enrolled, 79 in each arm. They were aged between 18 - 44 years with an average age 26, 75 ± 3.65 years. We found this to be in consonance with published data [24]. Eighty (51%, 9%) were married, 67 (42%, 40%) were of primary level of education and equal proportions (42%, 40%) were full time house wives. As regards past histories, 120 (75%, 94%) and 126 (79%, 74%) respectively did not present any medical or obstetric histories that necessitated particular surveillance.

Premature rupture of membranes (PROM) was the major indication for induction in 44 (56%) of the 79 women who were induced. Reviewing the relevant literature, PROM is found to be second to post term gestations when considering indications for induction of labor in monofetal and as well as twin gestations [24-27]. Hypertensive disorders of pregnancy have not been reported in similar studies as indications for induction but 22.78% (18 cases) of inductions in this series were due to preeclampsia and eclampsia.

In a study carried out in the maternities of France between 2001 and 2002, 24.8% of inductions were for medical reasons [28]. Medical indications constituted 15.18% of our inductions. There were 12 cases of post term gestations and only 5 of them consented to induction. The rest did not because of fear or uncertainty of outcome. The decision to induce in twin gestations has been plagued with fear and uncertainty [28-31].

The women who were induced had a median gravidity of 3 with extremes of 2 - 7 pregnancies. In the group where labor was spontaneous, the median gravidity was 4 with extremes of 2 - 7 pregnancies. Though more women in the gravidity bracket G_2-G_3 were induced than those who delivered spontaneously, this observation was not significant (P ≤ 0.20). Between G_2-G_5, there was a greater representation of parturient who were induced, but again, this was not significant (P ≤ 0.20).

Median parity amongst the induced cases was 2 with extremes of 2 - 5 and 42 cases were para 1 and 2. These parities were similar among the women who were not induced. Parity among women with twin gestations vary. In some studies median parity has been reported as 3

Table 2. Maternal and fetal complications.

Complications	Induced	None induced	OR	95% IC	X²	P
PPH	10	13	0.74	0.3 - 1,8	0,46	≤0.50
Dynamic dystocia	2	4	0.49	0.09 - 2.76	0.69	≤0.50
Cesarean section (%)	10.12	13.92	0.7	0.27 - 1.85	0.46	≤0.50
Respiratory distress	1	2	0.5	0.04 - 5.55	0.34	≤0.90
Asphyxia neonatorium	4	4	1	0.25 - 4.07		

with extremes of 2 - 8. It has been reported that twin gestations are found among women with higher parities [32,33], but this observation was not noted in this study

In a Japanese study that compared induction and normal delivery in twin gestations, the average gestational age at induction was 37 ± 0.4 weeks as against 39 ± 1.1 weeks among those who were not induced. Our average gestational age at induction was 37 ± 0.9 weeks with extremes of 37 - 41 weeks. This was a bit much earlier than the women who were not induced (38 ± 1 week). In general terms, 70% of women with twin gestations will deliver between 35 and 37 weeks [33-35]. This differs from our findings where 93, 7% (n = 148) of the women had gestational ages that ranged between 37 - 40 weeks at induction or spontaneous labor, 76 (51.35%) of them in the group that was induced versus 72 (48.65%) in the group that was not induced but this did not show any significant statistical difference (OR 1, 44; 95% IC 0.44-4.75; P ≤ 0.90).

There is insufficient literature on antenatal care as concerns twin gestations which are considered high risk. Majority of the women recruited in both arms were followed-up by qualified attendants all through pregnancy. 148 of the 158 women received appropriate antenatal care, though those who were induced had more antenatal consultations than those who were not but there was significant difference in the number and quality of antenatal consultations in the two groups (OR 3.32; 95% IC 1.73 - 6.37; P ≤ 0.001). About ten women in the group that was not induced did not have any antenatal follow-up (P ≤ 0.01).

In a case control study of 81 twin gestations where 36 were induced with oxytocin, prostaglandins or laminaria tents and 45 others delivered without induction, the duration of labor in the two groups were similar (6.5 ± 2.8 hrs vs 6 ± 3.6 hrs) [36]. We found a difference in the duration of labor in the two groups, 6 hrs in the group that was induced as against 9.75 hrs in the group that was not induced, a difference of 3.75 hrs (P ≤ 0.001). In a study carried out over four years but with a smaller sample size where misoprostol was matched against oxytocin in induction of twin gestations greater than 34 weeks, the duration of labor in oxytocin group was 15.1 hrs [37].

In twin gestations, the mode of delivery depends on several factors. These include gestational age at the time of delivery, pregnancy related complications, states of the fetuses (intra-uterine growth restriction for example). In resource restricted settings where personnel do lack in quantity and quality, vaginal delivery is recommended in uncomplicated cases [38-40]. In this study, 139 women (87.97%) delivered normally 68 of them (89.87%) in the group that was induced and 66 (86.07%) in the group that was not induced and this slight difference was not significant statistically (OR 1, 22; 95% IC 0, 51-2, 92; P≤ 0.90).

In a study carried out in Nigeria over ten months where maternal outcome was evaluated among 71 women who bore twin gestations, normal delivery was recorded in 61.97% of the cases, a percentage we found lower than what we obtained [39]. Several other studies have reported vaginal delivery in twin gestations ranging from 68.4% to 82% [41-43]. Though these have all been small series that used different methods of induction, they have not shown any differences in the proportions of vaginal deliveries in induced and none induced cases.

In the absence of induction, rates of cesarean deliveries vary in different countries. In one hospital in Nigeria, the rate of cesarean delivery was reported as 41.3% [39]. The prevalence of cesarean delivery in this study was 12.09% (10.12% in induced cases versus 13.92% in none induced cases (OR 0, 7; 95% IC 0, 27-1, 85; P ≤ 0.50). Similar findings have been reported [44-47].

The main indications for cesarean delivery were fetal distress, dynamic dystocia, failed induction and retention of the second twin. Though induction increases the incidence of instrumental deliveries, we did not find any difference in the proportion of women to whom delivery was assisted instrumentally in the two groups (OR 1, 52; 95% IC 0, 25-9, 35; P ≤ 0.90).

The first minute APGAR scores for the first twins in the two groups were better than those of the second twins in all the 158 twin pairs. These tally with reports from studies carried out in Nigeria where APGAR scores of the first twins have been reported to be better than those of the second twins. In the group that was not induced, 5 out of 79 first twins had poor APGAR scores in the 1st

minute and by the 5th minute; there was persistence of poor APGAR scores in 2 of the twins. The median AP-GAR score in the 1st minute for the whole study was 8 with extremes of 6 - 10; and in the 5th, the median AP-GAR score was 9 with extremes of 9 - 10.

At birth, 155 first twins, that is, 98.10% had 1st minute scores > 7. The prevalence of scores < 7 in the 1st twins was 1.26% and 2%, 5% respectively for those whose mothers were induced and those whose mothers were not induced (P ≤ 0.90). For the second twins, scores < 7 in the 1st minute were 7.6% and 6.3 % respectively but the difference was not statistically significant (OR 1.22; 95% IC 0.36 - 4.17; P ≤ 0.90). Similar studies have reported no statistically significant differences in scores between the two groups.

There was no difference in birth weights of twins in both groups as has have been reported in literature [44]. In all the twin pairs, the average weight of the 1st twin was 2713 kg ± 500 gm in the women who were induced as against 2670 kg ± 460 gm in those who were not. For the 2nd twins, the average weight was 2706 kg ± 510 gm in induced cases and 2970 kg ± 420 gm in those who were not induced. These results are like those found in other reports where average weights of the 1st twins were found to be 2412 ± 600 g and those of the 2nd twins as 2485 ± 630 g.

We recorded 88.88% live births. As a whole, a greater proportion of the babies did not present any complications at birth, 148 (93%, 67%) in the group that was induced versus 145 (91%, 17%) in the group that was not induced. This difference was not significant statistically (P ≤ 0.20) as found in a randomized study where induction was compared to spontaneous delivery in uncomplicated twin gestations at 37 weeks [45]. We recorded 8 cases of neonatal hypoxia due to low birth weight (LBW) and delay in the delivery of the second twin, phenomena found in twin gestations.

Most of the women 79%, 74% (n = 126) did not present with intrapartum complications. There were 23 cases of post partum hemorrhage due to uterine atony, 10 in the group of women who were induced and 13 in the second group but the difference was not statistically significant (OR 0.74; 95% IC 0.3 - 1.8; P ≤ 0.50) similar to reports of similar studies [46,47]. There were no cases of uterine rupture.

6. CONCLUSION

Induction of labor in selected cases of twin gestations is possible even in under privileged situations. If decision to induce has been reached, maternal and fetal monitoring remains basic in this approach. Induction should be carried out only in centers with facilities for cesarean delivery and blood transfusion. Women in this category do not run special risks when compared to those whose labor is spontaneous.

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