

Research Article

Determinants of induction of labour in Alex Ekwueme Federal University Teaching Hospital, Abakaliki - A 4 year retrospective study

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Abstract...

Background: Induction of labour is a common obstetric procedure which is indicated when the benefits to the mother or fetus outweigh the benefits of continuing the pregnancy. It can involve a complex set of interventions that may defy routines and presents numerous choices and challenges for clinicians and mothers.

Aim: To determine the incidence, methods, indications and outcome of induced labour in Alex Ekwueme Federal University Teaching Hospital, Abakaliki.

Materials and methods: This was a retrospective study of cases of induced labour at the Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Nigeria, between January 1, 2020, and December 31, 2024. Data on the socio-demographic characteristics of the parturient, induction methods, indications for induction, outcomes and reasons for failed induction were extracted from personal case files and the hospital's delivery register and theatre records. The data were analyzed with Epi-info statistical package and the level of significance was at $p \leq 0.05$.

Results: The induction rate in this study was 3.21%. Induction was successful in 76.77% of cases but failed in 23.23%. Misoprostol was the commonest induction method (50.00%). The commonest indication for induction was postdate pregnancy (68.39%). Failed induction was due to fetal distress, prolonged labour, cephalopelvic disproportion and cord prolapse.

Conclusion: The low incidence of induced labour from this study could be a reflection of the unmet needs for this procedure thus the need for enlightenment among the medical personnel. The use of misoprostol for Induction of labour in well selected patients could be an appropriate method as was shown in this study.

Introduction

Induction of labour is the artificial initiation of labour before its spontaneous onset for the purpose of achieving vaginal delivery of the fetoplacental unit [1,2]. It is a common obstetric procedure which is indicated when the benefits to the mother or fetus outweigh the benefits of continuing the pregnancy [1,2]. It can involve a complex set of interventions that may

defy routines and presents numerous choices and challenges for clinicians and mothers. The rate of induction of labour varies by location and institution but appears to be increasing [1]. In Nigeria a rate of 6.6% was reported in Maiduguri [3]. According to the most current studies in the United States, the rate varies from 9.5 to 33.7 percent of all pregnancies annually [2].

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One of the most common indications for labour inductions is postterm pregnancy and induction for this indication has been shown to reduce the likelihood of perinatal death [3-5]. Other indications for induction include premature rupture of membranes especially at term or other situations that require termination of conservative management of high risk pregnancies, potential fetal compromise such as significant fetal growth restriction, non-reassuring fetal surveillance, maternal medical conditions like diabetes, renal disease, significant pulmonary disease, chronic or gestational hypertension, antiphospholipid syndrome, suspected or proven chorioamnionitis, abruptio placentae, and intrauterine fetal death [6-8]. Induction is sometimes performed for “social” or “geographic” reasons, without a medical or obstetric indication and also for maternal request [9,10]. However, there have been few well-designed studies evaluating induction for these indications [11,12].

Induction when successful results in vaginal delivery but sometimes fails with potential risks of increased rate of operative vaginal delivery, Caesarean birth, excessive uterine activity, abnormal fetal heart rate patterns, uterine rupture, maternal water intoxication, delivery of preterm infant due to incorrect estimation of dates, and possibly cord prolapse [11,13-17]. Prior to initiation of induction the woman must be assessed for its indications, contraindications to the procedure, gestational age, cervical favorability (Bishop score assessment), and assessment of the pelvis, fetal size, presentation, membrane status (intact or ruptured), and fetal wellbeing; documentation of discussion with the patient including indication for induction and disclosure of risk factors must be undertaken [18]. The state of the cervix is one of the most important predictors of a successful labour induction. In 1964, Bishop described a scoring system based on cervical examination that predicted vaginal delivery in multiparous women [18].

Demographic factors influencing the outcome of induction of labour are statistical characteristics of a population and include age, parity, gestation and marital status. Women demographic factors have been noted to influence the outcome of birth [19,20]. Socioeconomic factors influencing the outcome of induction of labour include characteristics such as educational level, religion, ethnicity, and economic status [20].

Induction of labour is a common Obstetric procedure which is aimed at achieving vaginal delivery in the absence of contraindications to vaginal delivery. In our environment, where high premium is placed on this route of delivery, it is therefore pertinent to further review this important Obstetric procedure which promotes it. There is therefore the need for the study in my institution to review the incidence and outcome of induction of labour as this study has not being conducted in this institution in the past.

This study is designed to review the incidence and outcome of induced labour over a 4 year period in the study area. The findings of this study would further highlight the importance of the relationship to enhance better outcomes for the mother and the baby.

Aim

To determine the incidence, methods, indications and outcome of induced labour in Federal Teaching Hospital, Abakaliki.

Table 1: Socio-demographic characteristics; age, parity, and gestational age at booking (N=310).

Socio-demographic variable	Frequency	Percentage
Age (Years)		
<20	4	1.29
20-24	24	7.74
25-29	143	46.13
30-34	93	30.00
35-39	45	14.52
≥40	1	0.32
Parity		
Parity 0	180	58.06
Para 1-4	101	32.58
≥5	29	9.36
Educational level		
No formal education	82	26.45
Primary	104	33.55
Secondary	100	32.26
Tertiary	24	7.74
Gestational age at booking (weeks)		
< 13	40	12.90
13-27	120	38.71
28-42	130	41.94
>42	15	4.84
Unbooked	5	1.61
Marital status		
Married	300	96.77
Single	2	0.65
Widowed	8	2.58

Table 2: Methods and indication for induction (N=310).

Variable	Frequency	Percentage
Method		
Misoprostol	155	50.00
Foleys Catheter	10	3.23
Foleys Catheter and amniotomy/oxytocin	75	14.19
Aminiotomy/Oxytocin	13	4.19
Membrane sweep	15	4.84
Membrane sweep and amniotomy/oxytocin	42	13.55
Main Indications		
Postdate	212	68.39
Term PROM	30	9.68
IUFD	22	7.09
Preeclampsia	20	6.45
Preterm PROM	7	2.26
Eclampsia	5	1.61
IUGR	6	1.94
Gestational DM	8	2.58

Specific objectives

1. To identify methods of induction with lesser failure rates
2. To further highlight the unmet needs of induction of labour in a low resource setting like ours

Materials and methods

Study design

This was a retrospective study of Incidence and Outcome of Induction of Labour from January 1st, 2020 to December 31st, 2024 conducted at the Obstetrics & Gynaecology department of Alex Ekwueme Federal University Teaching Hospital, Abakaliki.

Study population

All women that had induction of labour at the Alex Ekwueme Federal University Teaching Hospital, Abakaliki during this period.

Data collection

Data were retrieved from their personal case files, Operating Theatre records and delivery register. Data extracted into a study proforma focusing on socio-demographics, obstetrics characteristics, total number of deliveries, number of induced labour, percentage of induced labour and outcomes of induction of labour.

Data analysis

Data collection was done using a pre-designed proforma. Data analysis was done using Epi info software (7.2.1 CDC Atlanta Georgia). The results were expressed as frequency tables, percentages, mean and standard deviation. Associations between categorical data were analysed using χ^2 with a p value of ≤ 0.05 considered statistically significant.

Results

A total of 9,651 deliveries were recorded during the period under review. Of these 310 had induction of labour, giving an induction rate of 3.21%. The participants had varying levels of education as depicted in (Table 1). The vast majority (98.34%) were booked and received antenatal care. The gestational age at booking shows that 41.94% of parturient booked between 28 and 42 weeks of gestation, indicating that most women in the study environment still have the attitude of booking late in pregnancy, 38.71% booked at 13-27 weeks, 12.9% at <13 weeks, and 4.84% at >42 weeks. Primigravidae accounted for 58.06% of cases, 9.36% were grand multiparous, while others (32.58%) were Para 1-4 (Table 1).

Discussion

The process of induction of labor requires the intervention of a skilled birth attendant to prevent undue morbidity and mortality. Most of the parturient booked for antenatal care in their third trimester, thus not benefiting from some early pregnancy prophylactic interventions.

The induction rate of 3.21% in this study was much lower than the 6.6% reported from Maiduguri in Nigeria [3] and the 9.9-33.7% in the United States [2] but in agreement with 3% reported by Fawole et al. [21] and Ekele et al. [22]. This low induction rate could be explained by the WHO Global Maternal and Perinatal Health Survey secondary analysis by Fawole and

Table 3: Outcome of indication/ mode of delivery of induced parturient.

Variable	Frequency	Percentage
Methods and mode of delivery		
Misoprostol (N=155)		
Vaginal delivery	130	87.8
Caesarean section	18	12.2
Foleys catheter (N=10)		
Vaginal delivery	4	40.00
Caesarean section	6	60.00
Foleys catheter and aminotomy /oxytocin (N=75)		
Vaginal delivery	52	70.3
Caesarean	23	29.7
Aminotomy/Oxytocin (N=13)		
Vaginal delivery	7	53.8
Caesarean	6	46.2
Membrane sweep (N=15)		
Vaginal delivery	7	46.7
Caesarean section	8	53.3
Membrane sweep and aminotomy / Oxytocin (N=42)		
Vaginal delivery	30	71.4
Caesarean section	12	28.6

Table 4: Reasons for failed induction of labour (N=72).

Variable	Frequency	Percentage
Methods and mode of delivery		
Misoprostol (N=18)		
Fetal distress	6	33.33
Prolonged labour	2	11.11
Cephalopelvic disproportion	10	55.56
Cord prolapsed	0	0.00
Foleys catheter (N=6)		
Fetal distress	2	33.3
Prolonged labour	4	66.7
Foleys catheter and aminotomy/oxytocin (N=22)		
Fetal distress	15	68.18
Cephalopelvic disproportion	6	27.27
Cord prolapsed	1	4.55
Aminotomy/Oxytocin (N=6)		
Fetal distress	1	16.7
Prolonged labour	5	83.3
Cord prolapse	0	0.00
Membrane sweep (N=8)		
Prolonged labour	8	100.0
Membrane sweep and aminotomy/Oxytocin (N=12)		
Fetal distress	10	83.3
Prolonged labour	2	16.7

colleagues that determined that African countries had a high rate (66.0-80.2%) of unmet need for labour induction [21]. The commonest indication for induction of labour which was post-date accounted for 68.39% which is higher than 46.8% reported in Maiduguri, Nigeria [3]. This variance could be due to the fact that women in the North-Eastern part of the country marry at a younger age than their South-eastern counterparts and thus are likely to have higher parity which limits the use of misoprostol. Postdate and hypertensive diseases of pregnancy were both reported as the commonest indication in Sokoto by Ekele et al. [22]. Other indications for induction in this study were term premature rupture of membranes, intrauterine fetal death, preeclampsia, preterm premature rupture of membranes, eclampsia, intrauterine growth restriction, and gestational diabetes; these indications are similar to those reported in Maiduguri, Sokoto, as well as, India, Canada, and the United States [6,8]. These indications were mainly for high risk pregnancies that required termination with early induction of labour to prevent perinatal and maternal morbidity and mortality. In such situation, the maternal and fetal risk associated with continuation of the pregnancy should be weighed against the benefits of discontinuation, especially considering the poor health seeking behavior of parturient in sub-Saharan Africa as well as the lack of modern facilities for fetomaternal surveillance.

The commonest method of induction (misoprostol) used for cervical ripening in this study could be followed by oxytocin titration after an interval of 6 hours in those in whom contractions were less than three in ten minutes. In all cases in which misoprostol was used, the vaginal route of administration was preferred, even though there have been reports of other equally effective routes such as the sublingual and rectal routes [8]. The 50-microgram dosage used was in line with the World Health Organization recommendation of 25-50 micrograms [22,23]. Although misoprostol is currently not approved for induction of labour in the United States and United Kingdom, its use is approved by several local departmental protocols in Nigeria, since the other prostaglandins such as Prostaglandin E2 recommended by the National Institute of Health and Clinical Excellence (NICE) and the Royal College of Obstetricians and Gynecologists (RCOG) are usually unaffordable and unavailable in our resource constrained setting [24]. To prevent the risk of possible uterine rupture associated with the use of the prostaglandin E1 analogue (misoprostol), intracervical extraamniotic Foley catheter and membrane sweep are preferred methods in those at high risk of possible uterine rupture, such as the grand multiparae, those with previous uterine surgeries or uterine dilatation and curettage. The use of these methods in a reasonable proportion of our subjects was therefore not surprising since a significant proportion of the participants were multiparous with some having risk factors for uterine rupture. The overall failed induction rate was 23.23% which is higher than 17.5% reported by Seyb et al. [14]. However, the success rate of 87.8% versus 40% for misoprostol and catheter, respectively, in this study is lower than the finding in Maiduguri. This disagreement success rates could be due to parity which may influence the choice of induction method. Other methods such as amniotomy and oxytocin, Foleys catheter with amniotomy/oxytocin as well as membrane sweep used in this study were reportedly used in Maiduguri by Bako et al. [3] for similar indications with similar outcomes.

The complications noted with the various method of induction included fetal distress, prolonged labour, cephalopelvic disproportion, and cord prolapse. Some of these complications

were prevented by good patient selection and partographic monitoring of labour events. Measures like the use of intravenous fluids, intranasal oxygen administration and outright stoppage of induction in some cases when complications were noted were also undertaken.

Conclusion

Induction of labour is beneficial and safe in high risk pregnancies when the benefits of early delivery outweigh the risk of continuation, but this is not without attendant complications and failures which can be significantly reduced with proper patient selection, good preparation, as well as adequate fetomaternal monitoring to ensure a favorable obstetric outcome of a healthy mother and baby. The low incidence of induced labour from this study could be a reflection of the unmet needs for this procedure thus the need for enlightenment among the medical personnel. The use of misoprostol for induction of labour in well selected patients could be an appropriate method as was shown in this study.

Author declarations

Authors contribution: Principal Author is C Nwaogwugwu, Study design and formation of methodology and Data was analyzed by AA Olaleye and J Egede, Manuscript writing by CI Ebere and B Olinya, and sample collection by C Nwaogwugwu, AA Olaleye, and B Olinya. Result and discussion were written by AA Olaleye, and J Egede.

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