

Indications and outcomes of induction of labour among induced women in a tertiary hospital in Southwest Nigeria: a five-year review

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Abstract

Background: Induction of labour (IOL) is a common obstetric practice worldwide when the continuation of pregnancy poses a threat to the well-being of the mother or fetus.

Objectives: This study assessed the indications and outcome of labour induction among induced women in a tertiary hospital in Southwest Nigeria.

Method: A 5-year review of records of all clients that had induction of labour at the facility between January 1, 2012, and December 31, 2016, was conducted, and analysis was done using IBM® SPSS version 23. Results were presented in tables and charts using frequencies and percentages. Chisquare test was used to assess for association between sociodemographic/obstetrics characteristics and the mode of delivery, with significance level (α) set at 0.05.

Results: A total of 286 women were induced during the period, with 79.0% successfully achieving vaginal delivery. Postdate pregnancy was the commonest 88 (30.6%) indication for IOL, and majority of 233 (81.5%) of the women had no complications.

Conclusion: The major indication for IOL in this study was postdate pregnancy, and the study observed a high success rate among women who had IOL, with very few reports of complications in both the mother and fetus.

Indications et résultats du déclenchement du travail chez les femmes provoquées dans un hôpital tertiaire du sud-ouest du Nigeria : une revue quinquennale

Resume

Contexte: Le déclenchement du travail (LIO) est une pratique obstétricale courante dans le monde entier lorsque la poursuite de la grossesse constitue une menace pour le bien-être de la mère ou du fœtus.

Objectifs : Cette étude a évalué les indications et les résultats du déclenchement du travail chez les femmes provoquées dans un hôpital tertiaire du sud-ouest du Nigeria.

Méthode: Un examen sur cinq ans des dossiers de toutes les clientes ayant subi un déclenchement du travail dans l'établissement entre le 1er janvier 2012 et le 31 décembre 2016 a été réalisé et l'analyse a été effectuée à l'aide d'IBM® SPSS version 23. Les résultats ont été présentés dans tableaux et graphiques utilisant des fréquences et des pourcentages. Le test du chi carré a été utilisé pour évaluer l'association entre les caractéristiques sociodémographiques/obstétricales et le mode d'accouchement, avec un niveau de signification (α) fixé à 0,05.

Résultats: Au total, 286 femmes ont été induites au cours de la période, dont 79,0 % ont réussi à accoucher par voie vaginale. La grossesse post-datée était l'indication la plus courante (88 (30,6 %) pour l'IOL, et la majorité des 233 (81,5 %) des femmes n'avaient aucune complication.

Conclusion: La principale indication de la LIO dans cette étude était la grossesse post-datée, et l'étude a observé un taux de réussite élevé chez les femmes qui avaient une LIO, avec très peu de rapports de complications chez la mère et le fœtus.

INTRODUCTION

Induction of labour (IOL) is a common obstetric intervention widely carried out all over the world in cases where the continuation of pregnancy is hazardous to the mother or fetus, or both.(1) This is carried out when the critical assessment of the obstetric balance; the benefit of terminating the pregnancy far outweighs that of continuing it.(2)

There were many critics of the induction of labour in the early years. Despite this, induction of labour in normal women has continued to gain acceptance on a wide front as the rates have increased over the years.(3)

The indication for IOL must be specific and unambiguous.(4) These indications could be fetal, maternal or both, which include prolonged pregnancy, intrauterine growth restriction, premature rupture of membrane, chorioamnionitis, poly-hydramnios, stabilization induction for unstable lie, intrauterine fetal death and fetal congenital abnormalities.(5,6) Medical conditions in pregnancy such as hypertension, renal and liver disease, valvular heart disease and diabetes mellitus.(2,6) Nowadays, it is rare to consider labour induction purely in the maternal interest, because IOL has been shown to reduce perinatal mortality (6,7) nevertheless, prolonged pregnancy remains the commonest indication for induction of labour in this environment.(5)

Before the commencement of induction of labour, it is important to rule out conditions that may preclude vaginal delivery.(4) These include contracted or abnormal pelvis, persistent abnormal lie, pelvic tumors, placenta or vasa previa, umbilical cord prolapse with fetus alive, abnormal presentation like transverse lie or brow, two or more lower segment caesarean section scars or a classical caesarean section scar. Others are invasive carcinoma of the cervix, active genital herpes infection, and previous successful vesico-vaginal fistula repair and when the patient cannot be convinced to give consent.(6,8) However, obstetrics conditions such as twin gestation, grand multiparity, maternal cardiac disease, breech presentation, elderly primigravida, bad obstetric history and women with one previous lower segment caesarean section may not be absolute contraindications to labour induction.(6)

Labour should be induced only after the mother and the fetus are adjudged to be in satisfactory conditions. The need for recourse to caesarean section, if induction fails, must be explained to the patient, and the patient must give informed consent.(4,6) The intrapartum risks

between induced and spontaneous labour are comparable as long as uterine activity is monitored closely.(6)

The common methods employed in the induction of labour range from pharmacological methods using oxytocin and prostaglandins to surgical method by amniotomy. The synchronous use of oxytocin titrations and forewater amniotomy constitutes the oldest tried and time honoured and most widespread method of induction of labour the world over,(5) almost 99% in the early 1980s.(9) However, oxytocin alone remains the major drug for medical induction of labour in developing countries.(10,11)

Prematurity with the attendant risk of respiratory distress syndrome, cord prolapse, and uterine hyperstimulation are known complications of induction of labour.(12,13) Uterine hyperstimulation is more commonly associated with the use of prostaglandins, and this precludes their use in women of high parity. Other complications are intrapartum bleeding, precipitate labour, prolonged labour, failed induction, primary postpartum haemorrhage and genital tract injuries, including uterine rupture. Induction is said to fail when vaginal delivery cannot be achieved in a parturient on induction of labour, and caesarean section has to be performed. Caesarean section may be indicated for a variety of reasons, such as fetal distress, failure to achieve an active phase of labour despite escalating oxytocin infusion, cephalopelvic disproportion or cord prolapse.(4)

It is essential to continually review practices like IOL to gain insights into their indications, success and factors associated with successful outcomes. This will ensure evidence-based decision-making processes in improving existing guidelines and protocols at the facility. Therefore, this study assessed the indications, outcomes of labour induction and factors associated with the mode of delivery among induced women in a tertiary hospital in Southwest Nigeria.

MATERIALS AND METHODS

This was a retrospective review of client records delivered at Ladoke Akintola University of Technology Teaching Hospital, Ogbomoso, Nigeria (LAUTECH), between January 1, 2012 and December 31, 2016. Ladoke Akintola University of Technology Teaching Hospital is one of the tertiary facilities in Oyo State, Nigeria. The facility provides specialist medical services to the people of the town and environs and also serves as a training institution for all cadres of the

health workforce. Established in 2011, the hospital has many departments, one of which is the Obstetrics and Gynaecology department. Some of the services provided in this department include ANC and delivery for pregnant women. The facility takes an average of 1260 deliveries per annum, and this is one of the highest in the state.

The hospital numbers of women that had labour induction during the period under review were identified from the register at the labour room, and 286 folders were retrieved. A proforma was used to retrieve the necessary information from the folders. The information collected were: age, occupation, religion, tribe, the Bishop's score, indications and methods of induction, the induction-delivery interval, route of delivery, Apgar score of the baby at one and five minutes, indications for neonatal intensive care admission and complications that occurred. The data were analyzed, using IBM® SPSS version 23. Categorical variables were summarised using frequency and proportions in tables and charts, while continuous variables were summarised using mean and standard deviation. Chi-square test was used to assess for associations between sociodemographic/obstetrics characteristics and the mode of delivery. The level of significance (α) was set at <0.05 at 95%CI.

Ethical consideration: Ethical approval (LTH/OGB/EC/2020/210) was obtained from the research and ethics committee of the institution, and data with no direct relevance to the study were not extracted from the client records. All clients data extracted were treated confidentially.

RESULT

Table 1: Sociodemographic profile of the patient

Two-thousand nine hundred and five (2,905) deliveries were conducted during the five years, and 286 (9.9%) of the women had labour induction. The mean age of the women was 28.4 ± 6.1 years, and the majority (38.1%) were aged between 25 and 29 years. Most of the women, 188 (65.7%), were educated up to the tertiary level and the majority of them, 110 (38.5%) were civil servants.

Table 2: Obstetrics history of the patient

A little above half, 147 (51.4%) of the women were primigravida, with a hundred and thirty-five of them (47.2%) being nullipara. Most of the women, 224 (78.3%), had antenatal care, and the majority, 196 (68.5%) were induced using

oxytocin, with a mean induction time of 6.5 ± 3.6 hours.

Figure 1: Indications for induction of labour

The major indications for the induction of labour in most of the women were postdated pregnancy 87 (30.4%), premature rupture of membrane (PROM) 65 (22.7%), and severe pre-eclampsia/eclampsia 38 (13.3%), while the least common indication was previous perinatal death 12 (4.2%). (figure 1)

Table 3: Outcome of induction of labour

Most of the women, 226 (79.0%), had spontaneous vaginal deliveries, and the majority of the babies, 153 (53.5%) weighed between 2.50 and 3.49kg with a mean weight of 2.7 ± 0.7 kg. Most of the babies (188 (65.7%) and 219 (76.6%)) delivered had APGAR scores of greater than seven at 1 and 5 minutes, respectively. Most of the women, 233 (81.5%), had no complications from the IOL, with cervical laceration 21 (39.6%) being the most common complication among the 53 (18.5%) that had complications.

Table 4 Relationship between socio-obstetric characteristics and mode of delivery

Gravidity and booking status of the women were the two factors associated with the mode of delivery among women who had IOL. A significantly higher proportion of the women who delivered SVD were multigravida 129(57.1%), followed by primigravida 64(28.3%), ($\chi^2 = 14.189$, $p = 0.001$). Also, a significantly higher proportion of the women who delivered SVD attended antenatal care 166(73.5%), ($\chi^2 = 15.5$, $p = 0.001$).

DISCUSSION

This study's IOL rate (9.9%) was within the range (6.6%-11.5%) reported in studies across Nigeria.(14,16) This figure is however higher than Africa's rate, averaging 4.4%.(17) Compared to individual countries in Africa, a lower prevalence was reported in Niger (1.4%), and Algeria (6.8%), while in Ethiopia, a higher prevalence (20.4%) was reported.(18) Higher figures of labour induction have been reported in developed countries over the years compared to African countries (19). Although some authors have attributed this to the high level of unmet need for labour induction in African countries compared to developed countries, this may not be entirely true because in these developed countries, labour is sometimes induced without

any recognized medical indication; this may partly explain the high figures in these countries.(19) As reported in our study, labour induction is initiated in the presence of a recognised medical indication, and this was the case in other studies conducted in Nigeria.(14-17)

The major indications for initiating induction of labour in our study were postdate pregnancy, premature rupture of membrane (PROM) and pre-eclampsia/eclampsia. Postdate pregnancy increases the risk of fetal and neonatal morbidity and mortality considering the poor health-seeking behaviour of parturients in sub-Saharan Africa as well as the lack of modern facilities for feto-maternal surveillance (14); hence it is a major medical indication for initiating induction of labour. Similar studies in Nigeria equally reported postdate pregnancy, PROM and hypertensive disease in pregnancy as the prominent indications for IOL.(14-17), however, in the United Kingdom, about half of women had IOL without any recognized medical indication.

Two-thirds of women in this study had their labour induced with oxytocin. Oxytocin is the most common inducing agent worldwide, and it is available in many labour rooms in Nigeria with uses not limited to induction of labour alone.(20)

Despite this long history, misoprostol is fast becoming a choice induction agent in many facilities due to its additional benefits, such as being used for cervical ripening, being convenient to administer, and having fewer side effects.(21,22) Lawani et al., Okunola et al. and Ugwuoroko et al. reported misoprostol as the most used agent for labour induction in their studies.(14,16,23,24).

Overall, 8 in 10 women that had IOL in this study had a successful vaginal delivery, with the others delivered by caesarean section. Similar high success rates (75.9%) were reported by Lawani et al. in Cross River State (14) and 71.2% by Ugwuoroko et al. in Anambra State.(23) Slightly lower success rates were reported by Okunola et al.(69.8%) and Abisowo et al. (67.6%) (25), both in Nigeria.(16,25) Compared to other African countries, a study in Ethiopia reported a lower induction success rate of 65%,(26) while another in Uganda reported a success rate of 57.3%.(27) The major indication for the cesarean section among women with failed IOL in this study was foetal distress. Foetal distress is an emergency, and doing an emergency cesaerean section may be the quickest way of saving the fetus when such situations arise. Lawani et al. and Ugwuoroko et al. equally reported foetal distress

as the major indication for cesaerean section in women with failed induction.

Furthermore, the average induction-delivery interval in this study was 6.5 ± 3.6 hours, similar to a previous study in Benin City.(8) Oxytocin has been said to have a longer induction-delivery interval compared to misoprostol; however, this may not always be true as we reported a lower interval compared to the 12 ± 3.6 hours reported by Lawani et al. in their study where the major induction agent was misoprostol.(14) This difference could have arisen due to differences in the age and parity of women in both studies.

Furthermore, our study showed that the number of times a woman has been pregnant and attending antenatal care were the factors associated with outcomes. Those who had IOL in their first pregnancy were more likely to have a failed induction compared to those who had been pregnant multiple times. This finding is similar to what was reported by Okunola et al.(16) Age, method of induction, birth weight, indication for induction, and induction-delivery interval were the other factors that have been reported in previous studies to be associated with IOL outcomes; however this were not found to be associated in the current study.(16,23)

CONCLUSION

This study showed that labour induction is still strictly done based on medical indications, and the commonest indication observed in this study was postdate pregnancy, which lowers the prevalence of labour induction compared to what is obtained in developed countries. Also, the study observed a high success rate among women who had IOL, with very few reports of complications in both the mother and fetus. Therefore, the practice of IOL is safe even in low-resource settings like Nigeria, lacking sophisticated equipment for continuous intrapartum fetal monitoring, and it is encouraged that women are not denied this intervention when considered necessary to reduce maternal and perinatal death.

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Contribution of Authors: Ayinde M conceptualization of the study, data collation, manuscript preparation and revision of the final

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Table 1: Sociodemographic profile of the patient

Variable	Frequency (n = 286)	Percentage (%)
Age in years		
= 24	44	15.4
25 – 29	109	38.1
30 – 34	81	28.3
=35	52	18.2
Mean ± SD	28.4 ± 6.1	
Occupation		
Civil servant	110	38.5
Trading	92	32.2
Schooling	28	9.8
Artisan	24	8.4
Housewife	32	11.2
Level of education		
Primary	10	3.5
Secondary	88	30.8
Tertiary	188	65.7
Religion		
Christian	187	65.4
Islam	99	34.6
Tribe		
Yoruba	278	97.2
Igbo	4	1.4
Hausa	4	1.4

Table 2: Obstetrics history of the patient

Variable	Frequency (n = 286)	Percentage (%)
Booking status		
Booked	224	78.3
Unbooked	62	21.7
Gravidity		
Primigravida	147	51.4
Multigravida	90	31.5
Grand multigravida	49	17.1
Parity		
Nulipara	135	47.2
Primipara	62	21.7
Multipara	81	28.3
Grandmultipara	8	2.8
Mode of induction		
Prostaglandin	90	31.5
Oxytocin	196	68.5
Induction – delivery interval (in hours)		
< 3	14	4.9
3 – 12	256	89.5
>12	16	5.6
Mean ± SD	6.5 ± 3.6	

Table 3: Outcome of induction of labour

Variable	Frequency (n = 286)	Percentage (%)
Mode of delivery		
SVD	226	79.0
EMLCS	60	21.0
Indications for caesarean section (n=60)		
Fetal distress	24	40.0
Cephalopelvic disproportion	18	30.0
Slow progress of labour	8	13.3
Severe pre-eclampsia/eclampsia	4	6.7
Others	6	10.0
Birth Weight in Kg		
<2.50	87	30.4
2.50 – 3.49	153	53.5
3.50 – 3.99	38	13.3
=4.00	8	2.8
Mean ± SD	2.7 ± 0.7	
Sex		
Male	139	48.6
Female	147	51.4
M: F	1:1.05	
APGAR score at 1 minute		
<7	98	34.2
>7	188	65.8
APGAR score at 5 minutes		
<7	67	23.4
>7	219	76.6
Need for NICU admission		
Yes	61	22.4
No	225	77.6
Indication for NICU admission (n = 61)*		
Low birth weight	6	9.8
Neonatal seizure	2	3.3
Perinatal asphyxia	18	29.5
Macrosomia	6	9.8
Prematurity	20	32.8
Sepsis	8	13.1
Suspected upper GI obstruction	1	1.7
Maternal Complication		
Yes	53	18.5
No	233	81.5
Complications in mother (n=53)		
Cervical laceration	21	39.6
Perineal laceration	18	33.9
Uterine atony	10	18.9
Obstructed Labour	2	3.8
Fever	2	3.8
Fetal Complications		
Yes	34	11.9
No	252	88.1
Complications in fetal (n = 34)*		
Fresh stillbirth	4	11.8
Neonatal demise	5	14.7
Neonatal seizure	1	2.9
Perinatal asphyxia	17	50.0
Shoulder dystocia	5	14.7
Stillbirth	2	5.9

*Multiple responses NICU = Neonatal Intensive Care Unit

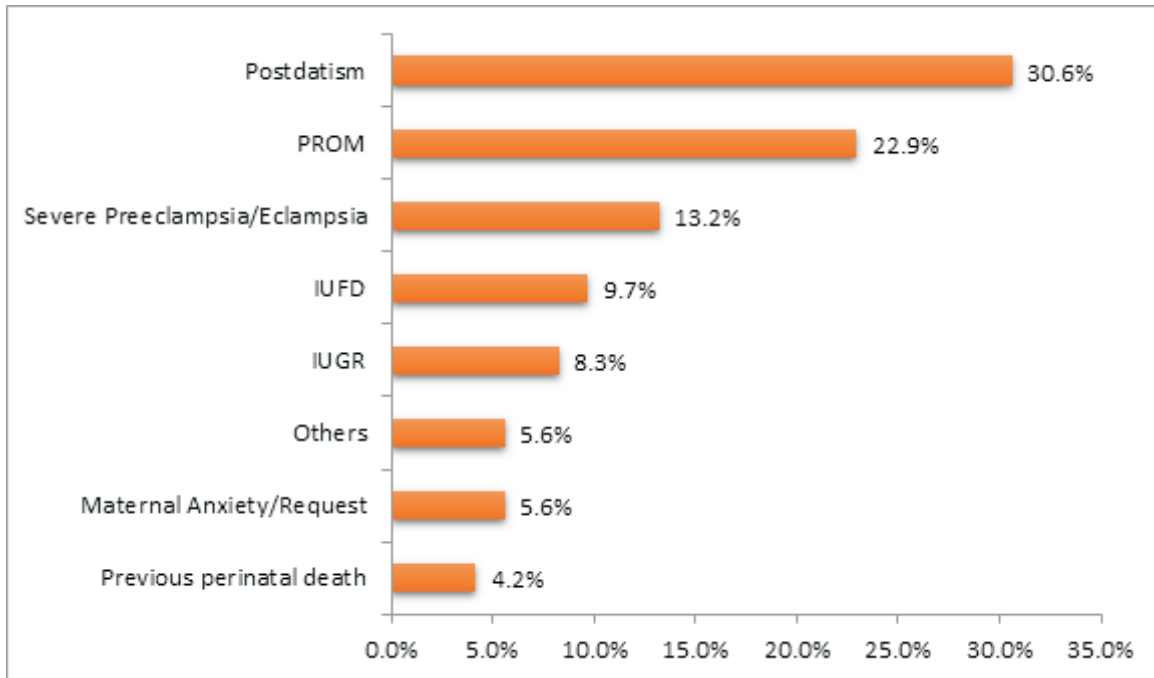


Figure 1: Indications for induction of labour

Table 4 Relationship between socio-obstetric characteristics and mode of delivery

Variables	Mode of delivery		Chi-Square (χ^2)	P-value (P)
	SVD n =226	CS n =60		
Age in years				
= 24	40(17.7)	4(6.7)	5.06	0.167
25 – 29	83(36.7)	26(43.3)		
30 – 34	61(27.0)	20(33.3)		
=35	42(18.6)	10(16.7)		
Mean \pm SD				
Gravidity			14.189	0.001*
Primigravida	64(28.3)	26(43.3)		
Multigravida	129(57.1)	18(30.0)		
Grand multigravida	33(14.6)	16(26.7)		
Parity			6.453	0.092
Nulipara	99(43.8)	36(60.0)		
Primipara	50(22.1)	12(20.0)		
Multipara	71(31.4)	10(16.7)		
Grandmultipara	6(2.7)	2(3.3)		
Booking Status			15.05	<0.001*
Booked	166(73.5)	58(96.7)		
Unbooked	60(26.5)	2(3.3)		
Method of induction of labour			2.330	0.127
Oxytocin	150(66.4)	46(76.7)		
Prostaglandins	76(33.6)	14(23.3)		

*Significant