An Observational Study on the Outcome of Induced Labours in a Tertiary Care Hospital

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Abstract: _Background: Induction of labour is a process where labour is initiated artificially in a woman by mechanical or pharmacological ways to achieve vaginal delivery of fetoplacental unit. Objective: 1. To find out the pattern of outcome among induced labours in a tertiary care hospital.2. To find out the factors influencing the induction delivery interval. Material and methods: The present study was a prospective observational study carried out in the department of obstetrics and gynaecology between December 2015 to November 2016. The study participants included pregnant women who were admitted to OG department and in whome labour was induced. The sample size for the study was calculated to be 200. Results: 4% participants had lateral vaginal wall tear, 3% had tachysystole and 2% had atonic PPH as complications 51% of the babies had birth weight between 2.5 to 3 Kgs.5% of the neonates were admitted to NICU. Being primi poor bishop score, method of induction and receiving epidural anaesthesia were the factors found to be associated with increased induction delivery interval in the present study. Conclusion: The number of failed inductions was found to be lesser in the present study. With regard to foetal outcome, the number of NICU admissions was comparable_

Keywords: Induced labour, outcome, induction delivery interval, indication, method of induction

1. Introduction

Induction of labour is a process where labour is initiated artificially in a womanby mechanical or pharmacologicalways to achieve vaginal delivery of fetoplacental unit (1) (2) . It is common procedure and mainly performed when the benefit of the procedure outweighs that of continuing the pregnancy. Though many ways are available for inducing a labour, mechanical, prostaglandins and oxytocin were the ones commonly used (3) Vaginal delivery within 24 to 48 hours of induction of labour is called successful induction and induction in the absence of acceptable foetal or maternal indications is called elective induction (4) .

The indication of induction of labour shall also be a sufficient induction for Caesarean section because in case of failed induction the next alternative will only be caesarean section (5) . The main reasons for induction include post term pregnancy, PROM, medical termination of pregnancy and high blood pressure (6) . It was reported that over the years the rate of labour induction had raised from 9 to 20 percentage (7) . Some studies have reported that induction of labour in nulliparous women with unfavourable cervix to be contraindicated (8) . Induction labour in certain complicated pregnancies like GDM aided in decreasing the number of caesarean sections in that particular sub group (9) . 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 (10) .

The objectives of the present study were to find out the pattern of outcome among induced labours in a tertiary care hospital and also to find out the factors influencing the induction delivery interval. Similar studies were not conducted in the present study centre before. The present study will through a light on the characteristic of induced labour, outcome of induced labour and factor involved in prolonging the induction delivery interval.

2. Literature Survey

The present study was purposed to through light up on the characteristics of induced labour and its outcome. Debele TZ et al reported the proportion of failed induction to be 31.4% (11) . Lawani O et al reported the induction rate to be 11.5%. Most common method was that of misoprostol. The mean induction delivery time was reported as 12 ± 3.6 hours (2). Arul kumaran S et al reported that among the babies born out of induced labour, 4.7% required NICU admission and 1.2% required intubation (12).

3. Material and Methods

The present study was a prospective observational study carried out in the department of obstetrics and gynaecology, G. Kuppuswamy Naidu Memorial Hospital, Coimbatore. The study participants included pregnant women who were admitted to OG department and in whome labour was induced for various indications. The study was carried out for a period of one year between December 2015 to November 2016. The sample size for the study was calculated to be 200 based on the formula N= $(Z^2 *P (1 - P))$ /d^2. Where, Z - 1.96, P - 65%, d - 0.05.

On admission of the patient to hospital, the particulars of the patient such as age, parity, detailed history of the present pregnancy, menstrual history with LMP, family history and past history were recorded. A thorough general physical examination was done followed by local examination including per abdominal and per vaginal examination. The indication of induction of labour for each case noted and the

method / agent for induction chosen according to individual case. Prior to induction written consent was obtained. Basic requirements and contraindications for induction was assessed. The passage was assessed and bishop score charted.

The induced patients were monitored in labour room, where maternal and foetal monitoring with NST and intermittent auscultation of foetal heart rate was performed. Maternal and foetal outcomes were observed. Maternal outcomes including mode of delivery, induction delivery interval, complications of induction like postpartum haemorrhage, hyperstimulation, prolonged labour were studied. Foetal outcomes include APGAR scores, admission to NICU and perinatal mortality. All the data collected were recoded into an interview schedule.

Statistical analysis
The data collected were entered into Microsoft excel and analysed using SPSS version 22. Quantitative variables were expressed using mean and standard deviation. Qualitative data were expressed using frequency and percentage. Chi square test was used to find the difference in distribution of qualitative variable between the groups. To find difference in mean between 2 groups, unpaired samples T test was used and to find the difference in mean between three groups, ANOVA was used. A P value of less than 0.05 was considered to be statistically significant.

4. Results

Among the 200 participants in the study, 49% belonged to the age group 26 to 30 years followed by 32% in the age group 21 to 25 years.63% were primi gravida.93% participants were in term.13% were having oligohydramnios.12.5% were having hypothyroid followed by 8.5% with gestational diabetes mellitus. Bishop score was found to be good in 38.5% of the participants (Table 1) In 55% of the participants, the indication was elective induction followed by 13.5% it was oligohydramnios and PROM, respectively. In 5.5% it was gestational diabetes mellitus and 5% it was decreased foetal movements (Fig 1).

51.5% were induced with PGE2, in 30.5% the induction was by both Foley's and PGE2. In 7.5% it was PGE2 and MISO.28% participants had received Syntocin augmentation. In 33% the mode of delivery was NI with EPI, 30.5% it was vacuum extraction and in 27% it ended with emergency LSCS. The induction delivery interval was 12 to 24 hours for 38% and less than 12 hours for 34.5%. Among those performed with emergency LSCS in 30% the indication was foetal distress and NPOL (arrest of dilation), respectively.39% were provided with epidural analgesia (Table 2).4% participants had lateral vaginal wall tear, 3% had tachysystole and 2% had atonic PPH as complications following induced labour.51% of the babies had birth weight between 2.5 to 3 Kgs and 32% had birth weight between 3 to 3.5 Kgs.5% of the neonates were admitted to NICU and 0.5% died (Table 3).

The mean induction delivery interval for primi parity was 21.35 ± 9.01 hours and that of multi para was 14.14 ± 6.12 hours. The mean interval was more in the primi group than

in the multi group with P value of less than 0.05. The mean induction delivery interval among participants with good bishop score was 12.73 ± 8.26 hours and that of poor bishop score was 22.41 ± 11.91 hours. The mean induction delivery interval was more among the participants with good Bishop score than the participants with poor bishop score with P value less than 0.05. The induction delivery interval also varied with regard to the method of induction with P value of less than 0.05. Among the participants provided with epidural, the mean induction delivery interval was 24.08 ± 12.32 hours and the mean induction delivery interval among those who had not received epidural was 15.24 ± 9.76 hours. The mean was more in the epidural group than in the no epidural group with P value of less than 0.05 (Table 4).

5. Discussion

Induction of labour is a process where labour is initiated artificially in a woman by mechanical or pharmacological ways to achieve vaginal delivery of fetoplacental unit (1) . The present study was a prospective study carried out in the department of obstetrics and gynaecology, G. Kuppuswamy Naidu Memorial Hospital among pregnant women in whome labour was induced for a period of one year December 2015 to November 2016. The study was performed with an objective of finding out the pattern of outcome among induced labours in a tertiary care hospital and also to find out the factors influencing the induction delivery interval.

In the present study, 81% belonged to the age group 20 to 29 years. DhakalKb et al also reported a similar proportion in the age group 20 to 29 years (74.6%) (6) .63% of the participants were primi 93% of the inductions were done in term pregnancies. The proportion was higher in the present study in comparison to one by Lawani et al where the prevalence was 28.5%.61.5% had poor Bishop score (2) . The top three indications for induction in the present study was elective induction (55%), oligohydramnios (13.5%) and PROM (13.5%). DhakalKb et al reported post - dated pregnancy was the most common reason for induced labour (6) . The difference in the pattern could be due to the time difference in both the studies.

With regard to type of induction, PGE2 alone was given to 51.5% of participants. Lawani O et al reported a similar pattern of induction (2).73% had vaginal delivery and 27% had undergone emergency LSCS. Similar results were obtained by study conducted by Abisowo OY et al where the reported proportion of vaginal delivery among those undergone induced labour was 67.6% (13) . Anand MN et al reported a similar proportion of 75% to have undergone vaginal delivery (7) . In the present study outlet forceps delivery was 9.5% and vacuum assisted delivery was 30.5%. Richards MPM in his study reported that induced labour resulted in increased forceps aided delivery (14) . About 39% participants in the present study was provided with epidural anaesthesia. Macer J et al reported the proportion to be 83.8% (8) . The proportion of failed induction in the present study was 9% while it was higher in many other studies (11, 15)

The complications reported in the present study include lateral vaginal wall tear, tachysystole and atonic PPH. Small

TH et al reported that partial or complete rupture of uterus as one of the complications of induced labour (16) . The present study had reported 5 neonates to be admitted to NICU similar proportion was obtained by Arulkumaran S et al (12) Robson S et al reported that the rate of NICU admission was more for children born out of induced labour than a spontaneous one (17) . The mean interval was more in the primi group than in the multi group with P value of less than 0.05. Similarly poor bishop score, method of induction and receiving epidural anaesthesia were the factors found to be associated with increased induction delivery interval in the present study.

The present study was a single centre study which warrants cautious generalisability of the results obtained. Recall bias could play a minimal role due to the prospective nature of the study.

6. Conclusion

The number of failed inductions was found to be lesser in the present study. With regard to foetal outcome, the number of NICU admissions was comparable. Being a primi, poor bishop score, increased methods of induction and epidural analgesia were found to increase the induction delivery interval.

7. Future Scope

The present research will provide inside on the pattern of maternal complications and feotal outcomes and the above information will play a crucial role in future decisions taken regarding application of induction to pregnant women. A comparative study based on present evidence would yield a better understanding.

References

[1] Carlson NS, Dunn Amore A, Ellis JA, Page K, Schafer R. American College of Nurse - Midwives Clinical Bulletin Number 18: Induction of Labor. J Midwifery Womens Health [Internet].2022 Jan 1 [cited 2022 Sep 13]; 67 (1): 140. Available from: /pmc/articles/PMC9026716/

[2] Lawani OL, Onyebuchi AK, Iyoke CA, Okafo CN, Ajah LO. Obstetric Outcome and Significance of Labour Induction in a Health Resource Poor Setting. ObstetGynecol Int.2014; 2014: 1–5.

[3] Goel K, Gedam JK, Rajput DA, Bhalerao M v. Induction of Labor: A Review.2014 [cited 2022 Sep 13]; Available from: http: //imsear. searo. who. int/handle/123456789/183062

[4] Leduc D, Biringer A, Lee L, Dy J, Corbett T, Duperron L, et al. Induction of labour. J ObstetGynaecol Can [Internet].2013 [cited 2022 Sep 14]; 35 (9): 840–57. Available from: https: //pubmed. ncbi. nlm. nih. gov/24099451/

[5] Orji EO, Olabode TO. Comparative study of labour progress and delivery outcome among induced versus spontaneous labour in nulliparous women using modified WHO partograph. Nepal Journal of Obstetrics and Gynaecology [Internet].2008 Jan 1

[6] Dhakal KB, Dhakal S, Shrestha S, Bhandari S. Induction of labor in Mid - Western Hospital in Nepal: Practice and Solution. Nepal Journal of Obstetrics and Gynaecology [Internet].2017 [cited 2022 Sep 14]; 12 (2): 83–7. Available from: https: //www.nepjol. info/index. php/NJOG/article/view/19961

[7] Anand MN, Ubale SM, Anand NP, Naykodi P, Senapati JB, Babalgaonkar AA. Retrospective record based study of maternal and fetal outcome in induction of labour at 40 and 41 weeks of gestation in uncomplicated primigravida women. Int J Reprod Contracept ObstetGynecol [Internet].2022 Mar 1 [cited 2022 Sep 14]; 11 (3): 739–46. Available from: https: //go. gale. com/ps/i. do?p=AONE&sw=w&issn=23201770&v=2.1&it=r&id=GALE%7CA696125255&sid=googleScholar&linkaccess=fulltext

[8] Macer JA, Macer CL, Chan LS. Elective induction versus spontaneous labor: A retrospective study of complications and outcome. Am J Obstet Gynecol.1992 Jun 1; 166 (6): 1690–7.

[9] Melamed N, Ray JG, Geary M, Bedard D, Yang C, Sprague A, et al. Induction of labor before 40 weeks is associated with lower rate of cesarean delivery in women with gestational diabetes mellitus. Am J Obstet Gynecol.2016 Mar 1; 214 (3): 364. e1 - 364. e8.

[10] Whalley P, JAMA JP, 1963 undefined. Oxytocin and water intoxication. jamanetwork. com [Internet]. [cited 2022 Sep 14]; Available from: https: //jamanetwork. com/journals/jama/article - abstract/667741

[11] Debele TZ, Cherkos EA, Badi MB, Anteneh KT, Demssie FW, Abdo AA, et al. Factors and outcomes associated with the induction of labor in referral hospitals of Amhara regional state, Ethiopia: a multicenter study. BMC Pregnancy Childbirth [Internet].2021 Dec 1 [cited 2022 Sep 15]; 21 (1). Available from: https: //pubmed. ncbi. nlm. nih. gov/33743637/

[12] Arulkumaran S, Gibb DMF, Heng SH, Ratnam SS. Perinatal Outcome of Induced Labour. Asia Oceania J ObstetGynaecol [Internet].1985 Mar 1 [cited 2022 Sep 14]; 11 (1): 33–7. Available from: https: //onlinelibrary. wiley. com/doi/full/10.1111/j.1447 - 0756.1985. tb00044. x

[13] Abisowo OY, Oyinyechi AJ, Olusegun FA, Oyedokun OY, Motunrayo AF, Abimbola OT. Feto - maternal outcome of induced versus spontaneous labour in a Nigerian Tertiary Maternity Unit. Trop J ObstetGynaecol [Internet].2018 Oct 10 [cited 2022 Sep 14]; 34 (1): 21–7. Available from: https: //www.ajol. info/index. php/tjog/article/view/178365

[14] Richards MPM. The induction and acceleration of labour: some benefits and complications. Early Hum Dev [Internet].1977 [cited 2022 Sep 15]; 1 (1): 3–17. Available from: https: //pubmed. ncbi. nlm. nih. gov/399461/

[15] Mebratu A, Assefa DG, Zeleke ED, Mengistu N, Woldesenbet TT, Aynalem A, et al. Failed induction of labor and associated factors among women delivered in Jigjiga University Sheik Hassan Yabare Referral Hospital: a cross - sectional study. Curr Med Res Opin

[Internet].2022 [cited 2022 Sep 15]; 38 (9): 1655–62. Available from: https: //pubmed. ncbi. nlm. nih. gov/35852409/

[16] SMALL TH. Complications and results of induction of labour. Med J Aust [Internet].1949 Mar 5 [cited 2022 Sep 14]; 1 (10): 292–5. Available from: https: //pubmed. ncbi. nlm. nih. gov/18144110/

[17] Robson S, Pridmore B, Dodd J. Outcomes of Induced Labour. Australian and New Zealand Journal of Obstetrics and Gynaecology [Internet].1997 Feb 1 [cited 2022 Sep 14]; 37 (1): 16–9. Available from: https: //onlinelibrary. wiley. com/doi/full/10.1111/j.1479 - 828X.1997. tb02211. x

Tables and figures

Table 1: Baseline characteristics among the participants

Variable		Frequency	Percentage
Age group (In years)	≤20	8	4
	21 - 25	64	32
	26 - 30	98	49
	>30	30	15
Parity	Primi	126	63
	Multi	74	37
Gestational age	Preterm	14	7
	Term	186	93
Antenatal complications	Anaemia	7	3.5
	Hypothyroid	25	12.5
	Previous LSCS	7	3.5
	Gestational HTN	6	3.0
	GDM	17	8.5
	Oligohydramnios	26	13
	Heart disease	5	2.5
	Twins	1	0.5
	APLA	1	0.5
	RH negative	4	2.0
	Fibroid	1	0.5
	IUGR	8	4.0
Bishop score	Poor	123	61.5
	Good	77	38.5
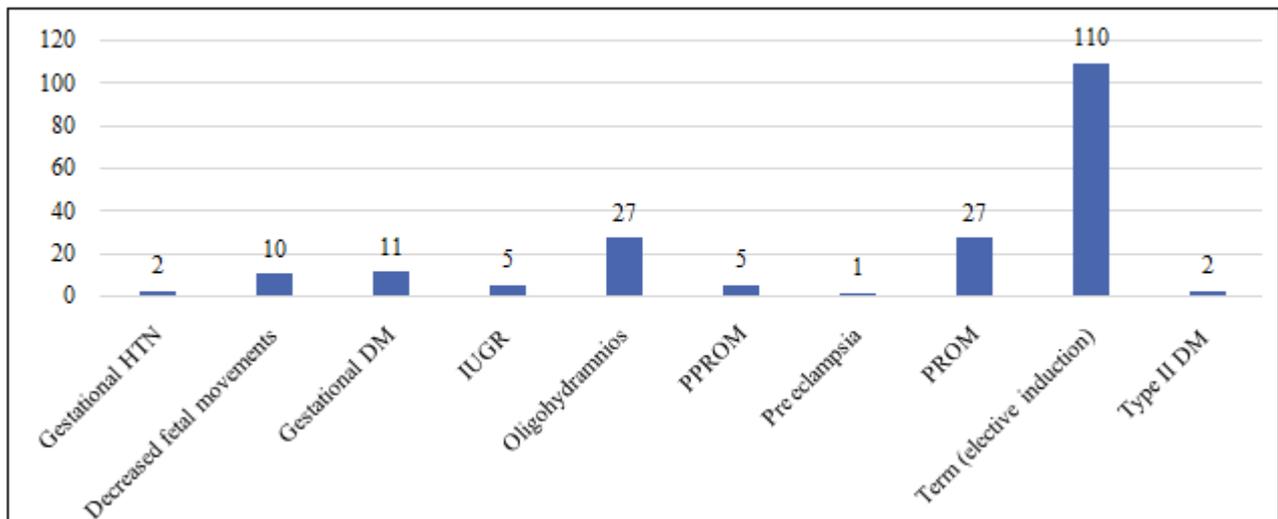
Figure 1: Bar chart showing indication for induction of labour

Table 2: Distribution according to factors related to induction of labour

Variable		Frequency	Percentage
Method of induction	Foley's, PGE2	61	30.5
	PGE2	103	51.5
	Foley's	6	3.0
	PGE2, MISO	15	7.5
	Foley's, PGE2, MISO	12	6.0
	Foley's, oral MISO	3	1.5
Syntocin augmentation	Yes	56	28
	No	144	72
Mode of delivery	Emergency LSCS	54	27
	NI with EPI	66	33
	Outlet forceps	19	9.5
	Vacuum extraction	61	30.5
Induction delivery interval (In hours)	<12	69	34.5
	12 - 24	76	38
	24 - 48	49	24.5
	>48	6	3.0

	Variable	Frequency	Percentage
Indication for caesarean (N=54)	Failed induction	5	9
	CPD	13	24
	Deep transverse arrest	3	5
	Foetal distress	16	30
	NPOL (arrest of dilation)	16	30
	Threatened scar rupture	1	2
Epidural analgesia in induced labour	Yes	78	39
	No	122	61

Table 3: Maternal complications and foetal outcomes among induced labour

	Variable	Frequency	Percentage
Complications	Atonic PPH	4	2.0
	Lateral vaginal wall tear	8	4.0
	Tachysystole	6	3.0
	Urge incontinence	1	0.5
	Nil	181	90.5
Birth weight	<2	4	2.0

(In Kgs)	2 - 2.5	17	8.5
	2.5 - 3	101	51
	3 - 3.5	65	32
	>3.5	13	6.5
Neonatal outcome	Good	189	94.5
	NICU admission	10	5
	Expired	1	0.5

Table 4: Comparison of mean induction delivery interval among various factors

Variable		Induction delivery interval (In hours)		P value
		Mean	SD	
Parity	Primi	21.35	9.01	<0.001
	Multi	14.14	6.12	
Bishop score	Good	12.73	8.26	<0.001
	Poor	22.41	11.91	
Method of induction	Foley's, PGE2	24.62	10.86	<0.001
	PGE2	13.24	7.86	
	Foley's	13.57	10.18	
	PGE2, MISO	21.55	13.97	
	Foley's, PGE2, MISO	33.50	13.71	
	Foley's, oral MISO	21.67	7.37	
Epidural usage	Epidural	24.08	12.32	<0.001
	Nil	15.24	9.76	

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