

The rate of induction of labor, methods, and outcome in primigravidae and multigravidae

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Summary

The aim was to review of cases of induction of labor and to identify rate, methods, and outcome in primigravidae and multigravidae. *Materials and Methods:* This was a retrospective study of medical charts review of cases of induction of labor-managed at King Abdulaziz University Hospital. During the study period 2,583 delivered and 150 cases had induction of labor. Patients details, clinical presentations, diagnosis, gestational age, method of induction, and mode of delivery identified, and outcomes were recorded. *Results:* During the study period 2,583 delivered in this institution and a total number of cases admitted for induction were 151 cases. The rate of induction was 5.8%. The range of age 19 to 46 years with a mean of 29.9 ± 5.87 years. The range of gravidity was 1 to 14 with a mean of 2.9 ± 2.14 . The range of gestational age was 27 to 43 weeks with a mean of 39.3 ± 2.72 weeks. Only 15.2% had cesarean section and 88.8% of multigravidae and of 77.4% primigravidae had vaginal delivery. Vaginal dinoprostone was given in 69.5% and oral misoprostol in 30.5%. In 26.63% of cases oxytocin was added. Bishop score were less than 3 in all cases. Age, gestational age, and duration was statistically significant in primigravidae vs. multigravida with a p value < 0.05 . The mode of delivery here was statistically different between the two group with a p value < 0.035 . The admitting diagnosis for induction of labor in 28.5% of cases were post-dated, 19.9% were GDM or 11.9% hypertensive patients, and only 6.6% were PROM. The others were only 17 cases, induced due to chronic medical illness. No statistically significant difference in fetal weight was seen with a p value < 0.966 , and with an Apgar score at five minutes or NICU admission or maternal complications. Apgar score at one minute was less than 7 in primigravidae more than multigravidae, with a p value < 0.017 , as well as the number of patients who had episiotomy with a p value < 0.001 . *Conclusion:* Induction of labor is beneficial and safe, even with low Bishop score less than 3; the rate of failure and outcome are similar in both primigravidae and multigravidae.

Key words: Induction; Labor; Primigravida; Multigravida.

Introduction

Induction is an obstetric procedure means artificial initiation of labor used to terminate pregnancy before onset of spontaneous labor for fetal or maternal indications [1]. Indication for induction includes post-term, PROM, maternal hypertensive disorders, suspicion of fetal macrosomia, maternal diabetes or intrauterine growth retardation [2].

The rate of induction of labor depends on the institution's clinical practice guidelines applied [2]. According to the most current studies, the rate varies from 9.5 to 33.7 percent of all pregnancies annually [3].

Induction of labor can be initiated by prostaglandin E2 (PGE2), vaginal and oral misoprostol, oxytocin, and mechanical methods [3, 4].

The aim of this study was to review of cases of induction of labor and to identify rate, methods, and outcome in primigravidae and multigravidae.

Materials and Methods

This was a retrospective study of medical charts review of cases of induction of labor-managed at King Abdulaziz University Hospital (KAUH), Department of Obstetrics and Gynecology, per-

formed from January 23, 2015, to August 15, 2015. During the study period, 2,583 delivered and 150 cases had induction of labor.

All data collected from medical record charts included patients details, clinical presentations, diagnosis, gestational age, method of induction, and mode of delivery identified and outcome. If delivery could not be achieved (failure of induction), then cesarean section was undertaken.

Inclusion criteria: pregnant patients admitted for induction of labor by either vaginal dinoprostone or oral misoprostol for any diagnosis managed at KAUH. *Exclusion criteria* cases were labor that begun spontaneously or induced by the mechanical method, and cases transferred to another facility or if their chart was found incomplete.

Ethical approval was obtained from hospital ethical committee. Authors have no conflict of interests, and the work not supported, or funded by any drug company.

Results

During the study period, 2,583 delivered in this institution and a total number of cases admitted for induction were 151 cases. The rate of induction was 5.8%. The range of age was 19 to 46 years, with a mean of 29.9 ± 5.87 years. The range of gravidity was 1 to 14 with a mean of $2.9 \pm$

Table 1. — *Patient's characteristics mode of delivery and medication used.*

Variable	Primigravida (n=53) Mean ± St.dev (min–max)	Multigravida (n=98) Mean ± St.de v(min–max)	<i>p</i>
Age in years	27.7 ± 5.19 (19–41)	31.3 ± 5.56 (19–43)	0.001*
Gestational age in weeks	39.4 ± 2.09 (31–43)	39.0 ± 2.96 (27–43)	0.044*
Time in hours	17.9 ± 3.99 (11–29)	15.6 ± 3.20 (11–29)	0.001*
Medication and mode of delivery	N/53 (%) N/53 (%)	N/98 (%) N/98 (%) OR 95% Confidence Interval	<i>p</i>
Medication			
√ Dinoprostone Vaginal	44/53 (83%)	61/98 (62.3%)	0.004
√ Oral misoprostol	9/53 (17%)	37/98 (37.7%) 2.96, (1.299–6.768)	
Delivery			
√ SVD	41/53 (77.4%)	87/98 (88.8%)	0.035
√ C/S	12/53 (22.6%)	11/98 (11.2%) 0.43, (0.176–1.061)	
Oxytocin			
√ No	43/53 (81.1%)	78/98 (79.6%)	0.166
√ Yes	10/53 (18.9%)	20/98 (20.4%) 1.103, (0.473–2.568)	

N = number; *St. dev.* = standard deviation; *min* = minimum; *max*: maximum; *W* = weeks; *SVD* = spontaneous vaginal delivery; *C/S* = cesarean section.

Table 2. — *Reasons for induction.*

Indication	Primigravida (n=53)	Multigravida (n=98)	n (%)
√ Post-term	22	21	43 (28.5%)
√ Diabetes	8	22	30 (19.9%)
√ PIH	4	14	18 (11.9%)
√ Decrease fetal move	3	14	17 (11.3%)
√ IUGR and oligohydramnios	7	9	16 (10.6%)
√ PROM	2	8	10 (6.6%)
√ Others	7	10	17 (11.3%)
Total	53	98	151 (100%)

Data are mean ± SD (range) or number (percentage). BMI, and Bishop score. IUGR = intrauterine growth restriction; PIH = pregnancy induced hypertension; PROM = premature rupture of membranes.

Table 3. — *The outcomes.*

	Primigravida (n=53)	Multigravida (n=98)	<i>p</i>
Fetal weight in grams	3033.5 ± 568.9 (1035-3765)	3028.9±652.7(962-3308)	<i>p</i> = 0.966
Fetal complication			OR 95% Confidence Interval <i>p</i> =
Apgar at one minute			
• < 7	10	6	0.280 (0.096–0.822) <i>p</i> = 0.017*
• > 7	43	92	
Apgar at five minutes			
• < 7	1	1	0.536 (0.033–8.747) <i>p</i> = 0.580
• > 7	52	97	
NICU			
• Yes	2	6	1.663 (0.324–8.543) <i>p</i> = 0.422
• No	51	92	
Maternal complications			
• Yes	5	5	0.516 (0.142–1.870) <i>p</i> = 0.244
• No	48	93	
Episiotomy			
• No	43	74	0.075 (0.033–0.173) <i>p</i> = 0.001*
• Yes	10	24	

Apgar = Apgar Score at one and five minutes; *OR* = odds ratio.

2.14. The range of gestational age was 27 to 43 weeks, with a mean of 39.3 ± 2.72 weeks.

In this study, 87% (128) of the cases had vaginal delivery on routine induction of labor and in 15.2% (23) of the cases induction failed. Eighty-seven cases (88.8%) of the multigravidae had a vaginal delivery and 41 in the primigravidae and their vaginal delivery rate was 77.4%.

Induction was by either by vaginal dinoprostone (1-2 milligramme every six hours) 69.5%, and oral misoprostol (20-25 micrograms every two hours). Bishop scores were less than 3 in all cases. In only 26.6% of cases oxytocin was added and when using the chi-square test to cross-tabulate in the group of primigravidae and multigravidae, the difference was statistically significant in the medication used with a p value < 0.004 , but with the added oxytocin, the difference was not statistically significant value with a p value < 0.166 (Table 1).

When comparing, the mean of the age in years, gestational age in weeks, duration from the start of induction until delivery in hours, between the primigravidae and multigravidae, using ANOVA table, the difference was statistically significant with a p value < 0.05 (Table 1)

The difference of mode of delivery between spontaneous vaginal delivery vs. cesarean section where statically significant different between the two groups with a p value < 0.035 (Table 1)

The admitting diagnosis for induction of labor in 28.5% of cases were postdated, 19.9% were GDM, 11.9% were hypertensive patients, and only 6.6% were PROM. The 17 cases were induced due to chronic medical illness (Table 2).

There was no statistically significant difference in fetal weight in grams, in primigravidae vs. multigravida, with a p value < 0.966 . There were no statistically significant differences in Apgar score at five minutes or in NICU admission or maternal complication. Apgar score in minutes was less than 7 in primigravidae more than multigravida with a p value < 0.017 , as well as the number of patients who had an episiotomy with a p value < 0.001 (Table 3).

Discussion

It is well known that failure to achieve vaginal delivery in the induction of labor is more common in primigravidae than in multigravidae. In one study, 66% of their cases had vaginal delivery and 34% cases had a cesarean section, 93% of multigravida had a vaginal birth, and only 47.5% of primigravidae [5]. In this study, 87% of the cases had vaginal delivery on routine induction of labor and only 15.2% of cases had a cesarean section; 88.8% of the multigravidae and 77.4% primigravidae had vaginal delivery

In this study all patients had Bishop scores less than 3 but in another study, cervical condition for delivery showed that 75% of patients with favourable cervix had a vaginal

delivery in comparison to the case of unfavourable cervix in only 55% cases which had a vaginal delivery [6].

Primigravidae were at significantly higher risk of fetal distress during labor and required an intensive fetal monitoring as compared to the multigravidae. In this study, the authors found that only Apgar score at 1 minute was different, but Apgar score at five minutes and NICU admission were the same. Primigravidae were also at significantly increased risk of having an episiotomy, as well as emergency caesarian section, than the multigravidae [7]

Misoprostol given orally or vaginally is safe and effective in promoting cervical ripening, it significantly shortened the duration of labor, and from starting the induction to delivery interval, in a hospital setting with close monitoring [8].

Induction of labor using mechanical methods and prostaglandins results in similar cesarian section rates, but have less uterine hyperstimulation. It is shown that mechanical induction does not change the number of patients not delivering in the first 24 hours.

Vaginal delivery in the first 24 hours was not achieved in multigravidae compared to the women induced with vaginal PGE2. Mechanical induction reduces the risk of caesarian section when compared with oxytocin (9). The findings of the present review do not provide evidence that high-dose oxytocin increases either vaginal delivery within 24 hours or the cesarean section rate.

There is no significant decrease in induction to delivery time with meta-analysis, but poor quality trials may confound these results. The effects of oxytocin at high dosed showed that it increase the rate of uterine hyperstimulation, but this is not clear.

The conclusions here are unique to the definitions used in this review. Further trials evaluating the effects of high-dose regimens of oxytocin for induction of labor should consider all significant maternal and infant outcomes [10] Women receiving prostein were more likely to have assisted vaginal delivery compared to the veridil group ($p = 0.04$) [11].

Conclusion

Induction of labor is beneficial and safe, even with low Bishop score less than 3 and the rate of failure and outcomes are similar in both primigravidae and multigravidae.

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