COMPARISON OF FREQUENCY OF CESAREAN SECTION IN ELECTIVE INDUCTION OF LABOUR AT 40^{+0} AND 41^{+0} WEEKS OF GESTATION

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ABSTRACT

Objective: To compare the frequency of cesarean section in elective induction of labour at 40 weeks and 41weeks of gestation.

Study Design: Comparative cross-sectional study.

Place and Duration of Study: Department of Gynecology & Obstetrics, Sialkot, from July to Dec 2017.

Methodology: The pregnant females at full-term were divided in 2 groups. All patients aged 20-35 years and parity less than 5 with singleton alive pregnancy and vertex presentation at 40^{+0} weeks gestation were placed in group A and all singleton alive pregnancies with vertex presentation at 41^{+0} weeks in group B. Group A was induced at 40^{+0} weeks and group B was induced at 41^{+0} weeks of gestation. Induction of labour was performed and fetal heart rate monitoring was conducted every 15 minutes. Augmentation was completed and frequency of cesarean section recorded in both groups.

Results: In this study a total of 100 patients were included. The mean age of the patients was 27.33 ± 4.87 years (range 20-35 years) with mean age of 26.54 ± 4.66 and 28.12 ± 4.99 years in group A and group B respectively. The cesarean section was performed in 20 (20%) patients, with 14 (28%) in group A and 6 (12%) in group B. Statistically significant difference of cesarean section was noted in both groups (p-value=0.046).

Conclusion: There was a significantly lower rate of cesarean section in elective induction of labour at 41weeks as compared to 40 weeks of gestation.

Keywords: Cesarean section, Gestational age, Induction of labour, Pregnancy.

INTRODUCTION

The planning of schedule of delivery is of prime importance in a normal pregnancy. A significant proportion of untoward incidences are encountered at the crucial period of term even in a healthy pregnancy. Preterm, late-term and even the post-term pregnancies are associated with noteworthy neonatal morbidity and maternal threats[1,2]. A pregnant woman is considered at term between 37 complete weeks and 42 weeks. At 40^{+0} weeks, it is considered as full-term pregnancy and beyond 42 weeks, the pregnancy is termed as post-term. Incidence of post-term pregnancies is 4-14%[3]. At term, there are two options, whether to wait for the unprompted onset of labour or proceed to elective induction of labour (at or a week after expected date of delivery) in case of low risk pregnancies.

There are certain threats associated with induction of labour (IOL), like uterine hyperstimulation, fetal abnormalities, cord prolapse, rupture of membranes[4], failed induction, prolonged hospital stay and increase cost/resource utilization[5]. In the developed world the induction of labour is conducted in more than 20% of pregnancies. It is essential when interference in the pregnancy is deliberated in promoting the health of the mother and of the neonate. Practically it is usually contemplated for post-date pregnancies, which are more than 41 weeks of gestation, where it has displayed increased survival in the perinatal period. Beyond 37 weeks of gestation there is a gradual upsurge in the perinatal impermanence and fetal instability, thus between 37 and 41 weeks a

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Received: 16 Nov 2019; revised received: 31 Dec 2019; accepted: 10 Jan 2020

planned induction of labour has a high probability to improve neonatal consequences.

Roughly 23 million caesarean sections were performed worldwide in 2012. At certain places caesarean sections appear to be more commonly executed than seemingly required. As a result governments and civil health services continue to promote agendas to lessen the use of caesarean section and prefer the delivery per vaginum[6]. A rate of 10% to 15% of caesarean sections is considered to be ideal and acceptable by most of the healthcare systems internationally. Contrary to this a few evidences seem to be convinced that a better outcome can be attained with a little higher rate of 19%[6]. In 2008, the caesarean section rate in United Kingdom was 24%. In 2009 it was 26.1% in Ireland, 26% in Canada in 2005-2006 and 31% in Australia in 2007. However the rate of caesarean section in United States is around 33% (varying over 23% to 40%) depending on the clinical, social and administrative scenarios.

Diverse work with contradicting results have been seen in literature regarding the relation of mode of delivery with the timing of delivery in low risk pregnancy. Due to the existing controversy among the results of different studies therefore a study was conducted to highlight the behavior of our patients with induction of labour at 40^{+0} and 41^{+0} weeks of gestation with the intent that according to the results on our population, we would able to implement a policy with confidence.

METHODOLOGY

This study was conducted at the Department of Gynecology and Obstetrics, Combined Military Hospital Sialkot Cantonment. Due approval was acquired from the Institutional Ethics Review Board (No: ERC/05/2019). It was a comparative cross-sectional study over a period of 6 months (from July 2017 to Dec 2017). A total of 100 cases were selected according to the consecutive non-probability sampling technique with 50 in each group i.e. group A and group B (sample size was calculated by using the WHO calculator utilizing data from study by Haq *et al*[7]).

According to the last menstrual period, all patients aged 20-35 years and parity less than 5 with singleton alive pregnancyand vertex presentation at 40^{+0} weeks gestation were placed in group A and all singleton alive pregnancies with vertex presentation at 41^{+0} weeks in group B. The exclusion criteria included term pregnancies with medical disorders (e.g. cardiac disease, hypertension, diabetes, thyroid disorders), pregnancy induced hypertension gestational diabetes, oligohydramnios and babies with congenital anomalies. The term pregnancies with history of cesarean or pelvic surgery were also excluded.

Anomalies were ruled out by anomaly scan at 18-22 weeks of gestation. Informed consent was taken. Group A was induced at 40^{+0} weeks and group B was induced at 41^{+0} weeks. In group A, a cardiotocogram trace was taken every 15 min-utes and her biophysical profile was noted. They were induced by Prostaglandin E2 (PGE2) placed per-vaginally in the posterior fornix and repeated at 6 hours interval in case of primigravida and in case of multigravida PGE2 placed only once. Intra-cervical Foley catheter was passed when the cervical os was 2cm and augmentation of labour conducted by artificial rupture of membranes and syntocinon infusion when cervical os was >4cm. While in group B, term pregnant ladies were advised to visit the clinic for antenatal checkup on every 3rd day and their biophysical profile was completed, as increased surveillance is required after 40 weeks to reduce perinatal demise. IOL was performed at 41^{+0} weeks according to same protocol as followed by group A and fetal heart rate monitoring was performed every 15 minutes and augmentation performed in the same manner as in group A. The frequency of cesarean section was recorded in both groups.

Data was entered and analyzed in SPSS version 20. Quantitative variables were presented as mean with standard deviation. Cesarean section rate was presented as frequency and percentages. Frequency of cesarean section was compared in both groups by using chi-square test. A *p*-value ≤ 0.05 was considered as significant.

RESULTS

In this study a total of 100 patients were included. The mean age of the patients was 27.33 ± 4.87 years (range 20-35 years) with mean age of 26.54 ± 4.66 years and 28.12 ± 4.99 years in group A and group B respectively. The pregnant ladies included in this study, in both group A and B, were from parity one to four, constituting 37, 32, 15 and 16 for parity 1, 2, 3 and 4 respectively (figure).

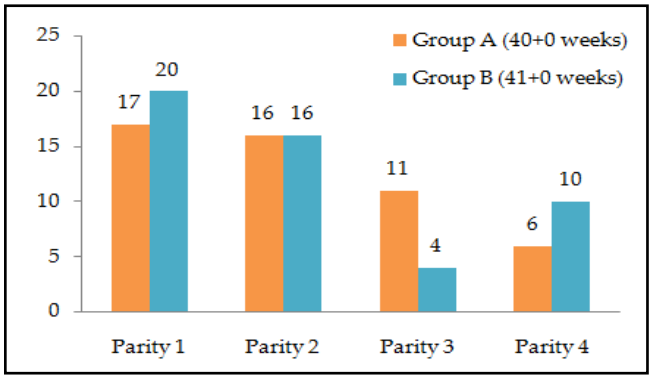

Figure: Comparison of parity in study groups (n=100).

The mean value of gestational age of the patients was 40.50 ± 0.50 weeks with minimum and maximum gestational ages of 40 & 41 weeks. Out of the 100 cases, 20 (20%) were subjected to cesarean section with 14 (28%) from group A and 6 (12%) from group B. Statistically significant difference was noted between the study groups regarding cesarean section i.e *p*-value=0.046 (table-I).

The study results showed that in ≤30 years patients, the cesarean section was performed in 14 cases in which 9 were from group A and 5 were from group B, similarly in >30 years patients the cesarean section was contemplated in 6 cases in which 5 were from group A and 1 was from group B. Statistically insignificant difference was found between the study groups with caesarean section stratified by age. i.e *p*-value=0.338 & 0.061 respectively (table-II). This study also showed that in primary parity patients, the cesarean section was performed in 12 cases in which 6 were from group A and 6 were from group B, while in multiparity patients the cesarean section was conducted in 8 cases and all were from group A. Statistically significant difference was found between the study groups with cesarean section in multi parity patients. i.e *p*-value=0.005 (table-III).

Table-I: Comparison of caesarean section with study groups (n 100).

Mode of Delivery	Group-A	Group-B	*p*-value
Vaginal Delivery	36	44	0.046
Caesarean Section	14	6	

Table-II: Comparison of caesarean section in study groups stratified by age.

Age (yrs)	Caesarean Section	Study Groups		*p*-value
		Group A	Group B	
≤ 30	Yes	9	5	0.338
	No	28	28	
> 30	Yes	5	1	0.061
	No	8	16	

Table-III: Comparison of Caesarean section with study groups stratified by parity.

Parity	Caesarean section	Study Groups		*p*-value
		Group A	Group B	
Primary	Yes	6	6	0.732
	No	11	14	
Multiple	Yes	8	0	0.005
	No	25	30	

DISCUSSION

NICE (The National Institute of Health and Care Excellence) guidelines[8] recommend that all women at 38 weeks of ante natal checkup should be informed about the hazards associated with pregnancy lasting more than 42 weeks and should also be intimated about the planning of induction of labour between 41^{+0} and 42^{+0} weeks of gestation. The management protocols of various obstetrics units vary from place to place. Induction of labour at the 39, 40 or 41 weeks of gestation still remains controversial and a lot of relevant data with contradicting results have been published in the last decade or so.

Caughey *et al*[9] reported that the planned induction of labour at 41 weeks pregnancy and further may be related to a decline in both the hazards of cesarean procedure and of meconium stained amniotic fluid. In a systematic review and meta-analysis, Wennerholm *et al*[10] also found a considerably lesser incidence of meconium aspi-

ration syndrome in planned induction of labour group in post-date pregnancy as compared to the expectant management group. However in a similar systematic review, Caughey *et al*[11] found that the evidence related to elective induction of labour preceding 41 weeks was not sufficient to make an inference. Likewise in this study, there was also insufficient evidence about the neonatal and maternal consequences. Population based cohort studies like Roos *et al*[12] and Mahomed *et al*[13] have also reported discordant results on the effect of induction of labour on caesarean section rates. Thus the concerns about the protocols not only exist in our set ups but also in the developed world. In our study we noted a 28% cesarean section at 40^{+0} weeks as compared to 12% at 41^{+0} weeks which was statistically significant (p=0.046).

Cesarean sections have indeed become quite common all around the world, including developed as well as the under-developed areas. The over documented cesarean section in nulliparous as well as the repeat cesarean sections should be carefully scrutinized and reviewed by audit[14]. Sinkey *et al*[15] compared the induction of labour in nulliparous females at 39 and 41 weeks of gestation, they found that the elective induction of labour at 39 weeks resulted in a lesser rate of cesarean section, maternal morbidity and neonatal disease, along with fewer still births and neonatal deaths. Likewise Odd *et al*[16] reported that singleton infants born at or after 41 weeks have a low Apgar score and are more prone to develop encephalopathy in the newborn period. On the other hand in a randomized control trial (Arrive Trial), comparing the induction of labour with expectant management, the induction of labor at 39 weeks in low-risk nulliparous women though did not cause a significant lower adverse perinatal consequence, but did result in a lower frequency of cesarean section[17]. Similarly, Keulen *et al*[18] reported reduced maternal as well as neonatal consequences, but the difference was not statistically significant, thus the expectant management did not appear to be quite inferior as compared to the induction of labour in uncomplicated pregnancies.

The induction of labour has been advantageous in the high risk group[19] but its role in the treatment of the post-dates is imprecise[20,21]. Interestingly in a population based cohort study conducted by Hassan *et al*[22] in Palestine, an overdoing of induction of labour was documented and in some units the majority was noted in singleton pregnancies before 40 weeks of gestation which in fact displayed a divergence from the evidence based medicine. In a meta-analysis, Middleton *et al*[23] concluded that induction of labour at or after term is associated with lesser perinatal deaths and cesarean sections as compared to the expectant management but the optimal timing for the induction still required further investigation and evaluation.

In a local study, Haq *et al*[7] evaluated the outcome of gestation on the mode of delivery. The frequency of cesarean section at 40^{+0} weeks was 28.2% as compared to 10.25% at 41^{+0} weeks, which was found to be statistically significant ($p \leq 0.05$). These results were similar to ours. However the higher number of vaginal deliveries in 41 weeks group was independent of connotation between the induction modality, parity and mode of delivery. Analyzing the international as well as national data, a solid consensus still seems to be ambiguous and mandates further studies in this aspect of a normal pregnancy.

CONCLUSION

The rate of cesarean section was significantly lower in elective induction of labour at 41^{+0} weeks of gestation as compared to 40^{+0} weeks. So the pregnant ladies reporting at 40^{+0} weeks of gestation can be safely monitored till 41^{+0} weeks and then subjected to the induction of labour with no increased chances of caesarean section. However this would require strict monitoring of maternal and fetal status.

CONFLICT OF INTEREST

There is no conflict of interest to be declare by any author.

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