ORIGINAL ARTICLE

A Study of Fetal Outcome in Induced versus Spontaneous Labor in Nulliparous Women at 41 Weeks of Gestation: Experience from a Tertiary Care Hospital

AMNA AZIZ[1], SUMAIRA IFTIKHAR[2], ANAM FATIMA[3], *MUHAMMAD NASIR[4], UMAIRA ALI[5], FATIMA ZIA[6]*
[1]Senior Registrar, Department of Obstetrics & Gynaecology, Nishtar Medical University & Hospital Multan
[2]Consultant Obstetrician and Gynecologist, Multan
[3]House Officer, Ghazi Khan Medical College, Dera Ghazi Khan
[4]Demonstrator Department of Community Medicine, King Edward Medical University, Lahore
[5]Postgraduate Trainee, Community Medicine, Rawalpindi Medical University, Rawalpindi
[6]Ex House Officer Bahawal Victoria Hospital, Bahawalpur Cell: 0321-4244433

ABSTRACT

Aim: To study the frequency of adverse fetal outcomes and to make comparison of the adverse fetal outcome in induced labor versus spontaneous labor in nulliparous womenat 41 weeks of gestation.
Study design: Comparative, cross-sectional study
Place and duration of study: Obstetrics & Gynecology Department Nishtar Hospital, Multan from 1st July 2015 to 31st January 2016.
Methods: All nulliparous of 18-35 years of age with singleton pregnancy at 41 weeks of gestation were included in the study. Effect modifiers like mode of labor, BMI, age, pregnancy induced hypertension, gestational diabetes were controlled by stratification and post-stratification chi-square test was applied.
Results: At the time of delivery the mean age of the patients in this study was 26.21±4.47 years. Spontaneous labor occurred in 99 (51.8%) pregnant females. There were 13 (6.8%) females with gestational diabetes and 8 (4.2%) were with pregnancy induced hypertension. There were 6 newborn babies with Apgar score <5 in induced labor group and only 1 baby was born with Apgar score <5 in spontaneous labor group (p-value 0.04). 9 babies in induced labor group were admitted to NICU after birth and 2 babies in spontaneous labor group (P-value 0.02).
Conclusion: Adverse fetal outcomes are associated with induction of labor as compared to spontaneous labor. Thereforewe should avoid induction of labor in pregnant ladies without any important indications.
Keywords: Spontaneous labor, Apgar score, Induced labor

INTRODUCTION

Induction of labor comprises artificial stimulation of uterine contractions with the purpose of attaining vaginal delivery.[1,2] In United States between 1990 to 2010, there is a gradual increase in the induction of labor before 42 weeks of pregnancy[3]. This shows that without considering any medical indication , rate of induction is increasing (also known as active induction of labor). However, the indication about non-medically indicated induction of labor and its effects on a variety of maternal and neo-natal outcomes is not clear[4].

It is still not clear whether induction of labor at<42 weeks in low risk pregnancy improves fetal outcomes, as perinatal morbidity in >39 weeks of gestation increases in a continuous, non-threshold fashion[5]. Kaimal et al[6] in their study has shown that maternal and fetal outcomes are improved if active induction of labor is carried out at 41 weeks of gestation as it is cost effective too. Also a Cochrane analysisrecommends that perinatal outcomes are better if induction at 41 weeks carried out, without raising the caesarean rates.[7]Yet another study by Selo-Ojeme et al[8] has presented dverse fetal out comes after nduction of labor compared to those with spontaneous labor. They have shown<5 Apgar score at 5 minutes in 8.9%, neonatal ICU admission in 3.2% neonates after induced labor while after spontaneous labor, it is seen in 0.1%, 1.7% respectively.

Received on 12-02-1019
Accepted on 13-08-2019

For the better fetal outcome of pregnancy at term the selection of mode of delivery, induction of labor verses spontaneous labor, is rare. Hence, our study was anticipated to find the adverse fetal outcomes frequency after induction of labor in nulliparous women at 41 weeks of gestation compared to those with spontaneous delivery. So based on these results, the better management option could be opted for better maternal as well as fetal outcomes.

MATERIALS AND METHODS

This was a comparative, cross-sectional study conducted at Department of Obstetrics & Gynecology, Nishtar Hospital. The nulliparous females,satisfying the inclusion/exclusion criteria were selected. Foetal outcomes were studied in terms of Apgar score, NICU admission (within 24 hours of birth), and final outcome as per-operational definition by the researcher. All this data was recorded. SPSS-20 was used for statistical analysis of data.

RESULTS

The mean age, mean body mass index of the patients and mean Apgar score in were shown in Table 1. Spontaneous labor occurred in 99 (51.8%) and induced labor by oxytocin occurred in 92 (48.2%) pregnant females. Frequency of females who developed gestational diabetes and hypertension during pregnancy is shown in Table 2. There were 7 (3.7%) newborn babies whose Apgar score was <5

at minutes after delivery while Apgar score was >5 in 184 (96.3%) patients (Table 3). There were 11 (5.8%) newborn babies who were admitted to neonatal Intensive Care Unit (NICU) immediately after birth. Stratification was done on the basis of mode of labor to see the effect of mode of labor on Apgar score <5 at 5 minutes after birth and NCU admission. We found that induction of labor was associated with significantly higher number of babies with Apgar score<5 at 5 minutes after birth as shown in Table 4. Induced labor was also associated with significantly higher number of NICU admissions of newborn babies (Table 5). There was not any significant effect of gestational diabetes on Apgar score and NICU admission after birth (p-value 0.42 and 0.35 respectively).The effect of pregnancy induced hypertension on Apgar score and NICU admission after birth was also non-significant (p-value 0.57 and 0.40 respectively). Age of mother had no significant effect on Apgar score and NICU admissions (p-value 0.37 and 0.84 respectively).We do not find any significant effect of body mass index on Apgar score and NICU admission of newborn babies after birth (p-value 43 and 0.46 respectively).

Table 1: Descriptive Statistics for age (years), body mass index (kg/m^2) and Apgar score

Variable	Mean±SD
Age	26.21±4.47
Body mass index	25.0±4.75
Apgar score	7.73±1.67

Table 2: Frequency of gestational diabetes and pregnancy induced hypertension

Variable	Yes	No
Gestational diabetes	13 (6.8%)	178 (93.2%)
Hypertension	8 (4.2%)	183 (95.8%)

Table 3: Frequency of Apgar score<5 and >5 and NICU admissions

Variable	No.	%
Apgar <5	7	3.7
Apgar >5	184	96.3
NICU (Yes)	11	5.8
NICU (No)	180	96.3

Table 4: Stratification for mode of Labor and Apgar score

Variable	Apgar Score		P-value
	<5	>5	
Spontaneous labor	1	98	0.04
Induced labor	6	86	

Table 5: Stratification for mode of labor and NICU admission

Variable	NICU Admission		P-value
	Yes	No	
Spontaneous Labor	2	97	0.02
Induced Labor	9	83	

DISCUSSION

In developed countries 20% of the deliveries are carried out through induction of labor which is a routine obstetric practice.[9] Usually it is carried out at 41 weeks of gestation by interfering the pregnancy, as it is a supposed to be more advantageous for the mother and baby. The council of health care standards Australia along with Core maternity indicator project considered it as an important indicator[10,11] Higher rates of caesarean delivery ia associated with failure of induction of labor.[12,13] It is obvious that labor Induction can raise the workload on maternity centres compared to spontaneous labor. The main purpose of this study was to see the fetal outcomes in mothers who underwent spontaneous or induced labor in terms of Apgar score and NICU admissions.

Our results showed significant effect oflabor induction on NICU admissions and Apgar score of the newborn babies. Apgar score was 6.25% in laborinduction group compared to only 1.01% in spontaneous delivery group, when taken as <5 at 5 minutes after birth. Selo-Ojemeet al[8] stated that <5 at 5minutes Apgar score was 8.9% in induced labor group and 0.1% in spontaneous labor group. This showed higher Apgar score in induction oflabor as compare to spontaneous delivery. Similarly NICU admissions were also higher according to this study i.e. 3.2% inlabor induction group and 1.7% in spontaneous labor group.In this study it was 2.2 % in spontaneous labor group and 9.78% in induced labor group. Thesefindings are supported by the findings from their study.

Saccone et al[14] concluded the reverse results in his study, that induction of labor is not associated with higher rate of cesarean deliveries with more intrapartum interventions and longer stay of mothers at hospital. Their results showed that fetal outcome is same between both the groups and it is not affected by mode of delivery. Many other researchers have also found that in elective induction of labor rates of maternal and fetal morbidity is higher[15-17].

CONCLUSION

More adverse fetal outcomes are significantly associated with laborinduction compared to spontaneous labor. So labor induction should be avoidedwithout any serious indications in patients.

REFERENCES

1. Keulen JK, Bruinsma A, Kortekaas JC, Van Dillen J, Bossuyt PM, Oudijk MA, et al. Induction of labour at 41 weeks versus expectant management until 42 weeks (INDEX): multicentre, randomised non-inferiority trial. BMJ 2019;364:l344.
2. Rydahl E, Eriksen L, Juhl M. Effects of induction of labor prior to post-term in low-risk pregnancies: a systematic review. JBI Database Systematic Rev Implementation Reports 2019;17(2):170.
3. Zenzmaier C, Leitner H, Brezinka C, Oberaigner W, König-Bachmann M. Maternal and neonatal outcomes after induction of labor: a population-based study. Arch GynecolObstet 2017;295(5):1175-83.
4. Darney BG, Snowden JM, Cheng YW, Jacob L, Nicholson JM, Kaimal A, Dublin S, Getahun D, Caughey AB. Elective induction of labor at term compared with expectant management: maternal and neonatal outcomes. Obstet Gynecol 2013;122(4):761.
5. Cheng YW, Kaimal AJ, Snowden JM, Nicholson JM, Caughey AB. Induction of labor compared to expectant management in low-risk women and associated perinatal outcomes. Am J ObstetGynecol 2012;207(6):502-e1.
6. Lawani OL, Onyebuchi AK, Iyoke CA, Okafo CN, Ajah LO. Obstetric outcome and significance of labour induction in a health resource poor setting. ObstetGynecolInt 2014;2014:1-5.
7. Sinkey RG, Lacevic J, Reljic T, Hozo I, Gibson KS, Odibo AO, Djulbegovic B, Lockwood CJ. Elective induction of labor

at 39 weeks among nulliparous women: The impact on maternal and neonatal risk. PloS One 2018;13(4):e0193169.
8. Selo-Ojeme D, Rogers C, Mohanty A, Zaidi N, Villar R, Shangaris P. Is induced labour in the nullipara associated with more maternal and perinatal morbidity? Arch GynecolObstet 2011;284(2):337-41.
9. Teitler JO, Plaza R, Hegyi T, Kruse L, Reichman NE. Elective Deliveries and Neonatal Outcomes in Full-Term Pregnancies. American journal of epidemiology. 2019 Apr 1;188(4):674-83.
10. Australian Council of Healthcare Standards. [Internet]. 2019 [cited 20 May 2019]. Available from: https://www.achs.org.au/programs-services /nsqhs-standards-2nd-edition/.
11. Supporting excellence in maternity care: the core maternity indicators project, Women's Hospital Australasia. [Internet]. 2019 [cited 20 May 2019]. Available from: https://www.achs.org.au/ programs-services /nsqhs-standards-2nd-edition/
12. 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 2017;34(1):21-7.
13. Middleton P, Shepherd E, Crowther CA. Induction of labour for improving birth outcomes for women at or beyond term. Cochrane Database Syst Rev 2018(5).
14. Saccone G, Berghella V. Induction of labor at full term in uncomplicated singleton gestations: a systematic review and metaanalysis of randomized controlled trials. Am J ObstetGynecol 2015;213(5):629-36.
15. Poma S, Scudeller L, Gardella B, Broglia F, Ciceri M, Fuardo M, et. al. Outcomes of induced versus spontaneous labor. J MaternFetalNeonatal Med 2017;30(10):1133-8.
16. Stock SJ, Ferguson E, Duffy A, Ford I, Chalmers J, Norman JE. Outcomes of elective induction of labour compared with expectant management: population based study.BMJ2012;344:e2838.
17. Attri N, Malhotra V, Nanda S, Chauhan M, Bhuria V. Comparison of the Maternal and Foetal Outcome in Induction of Labour by Sublingual and Vaginal Misoprostol. Indian Pract 2016 Feb 1;69(2):31-4.