Original Research Paper

Volume - 13 | Issue - 03 | March - 2023 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Obstetrics & Gynaecology

A STUDY OF PERIPARTUM OUTCOMES OF BORDERLINE VERSUS NORMAL AMNIOTIC FLUID INDEX AFTER 34 WEEKS OF GESTATION IN A TERTIARY CARE HOSPITAL , KOLKATA

Dr. Tania Guria M.B.B.S. , Final year post graduate trainee, IPGME&R and SSKM Hospital

ABSTRACT **Introduction:** Antenatal test is done to evaluate fetus health and the risk of adverse outcomes during the course of a pregnancy. Amniotic fluid is an important part of pregnancy which plays a vital role in the normal growth of the fetus and, promotes muscular-skeletal development and allows for easier fetal movement. **Aims:** To evaluate the value of AFI in predicting birth weight, fetal distress, meconium aspiration, fetal growth restriction, NICU admission and to evaluate feto-maternal risks associated with borderline amniotic fluid index: AFI 5 to 8 cm. **Materials and method:** The present study was a case control study. This study was conducted from 2020 to 2023 at IPGMER AND SSKM HOSPITAL. Total 80 patients were included in this study. Group A -cases n=40, group -B controls n=40. **Result:** It was found that, majority number of patients had [27 (67.5%)] vaginal delivery (including forceps and normal vaginal delivery) in Group-B compared to Group-A [18 (45.0%)] which was statistically significant (p=0.0331) and 20% (n=8) patients had meconium stained liquor/fetal distress in group B while 40%(n=16) patients had meconium stained liquor/fetal distress in group A which was statistically significant (p=0.0370). **Conclusion:** We concluded that poor peripartum outcomes were observed in borderline compared to normal amniotic fluid index after 34 weeks of gestation in a tertiary care hospital.

KEYWORDS : Antenatal test, BWT, Fetal Distress and Anaesthesia.

INTRODUCTION

Antenatal test is done to evaluate fetus health and the risk of adverse outcomes during the course of a pregnancy. Amniotic fluid is an important part of pregnancy which plays a vital role in the normal growth of the fetus and, promotes muscular-skeletal development and allows for easier fetal movement.

Amniotic fluid assessment is an essential part of evaluation of fetus health in terms of fetal distress, meconium aspiration, caesarean and fetal mortality. The assessment of amniotic fluid volume is very crucial for the survival of the fetus and the Amniotic Fluid Index (AFI) is the most common way for the estimation of amniotic fluid volume which is performed by ultrasound method. Studies have revealed that AFI is an accurate criterion for estimating adequate placental function. Amniotic fluid volume varies with gestational age, rising to a plateau between 22-39 weeks of gestation and reaching 700 and 800 ml, which correspond to an AFI of 14-15 cm. Any decrease or increase in the volume of amniotic fluid leads to complications in pregnancy .In most studies oligohydramnios has been defined as an AFI of 5 cm or less and its associated maternal and fetal complications are proven. However, there are different views about the range of borderline AFI. In a study done by Phelan et al borderline AFI is defined between 5 and 8 cm. Also, Gumus and Miller have defined a borderline AFI as an AFI of 5. 1.

In spite of different views on borderline AFI in different studies, there are, also, different views about its function and influence on maternal and fetal complications and medical care for fetus health. In most reported studies, the pregnancies with borderline AFI of 5-10 cm have shown outcomes such as nonreactive non-stress tests, fetal heart rate (FHR) deceleration, meconium aspiration, immediate caesarean delivery, low apgar score, LBW, NICU admission and SGA in comparison with control subjects with normal amniotic fluid level. Also the low amniotic index may increase the operative delivery rate. Also, according to Luo et al the pregnancy outcomes of a borderline versus normal AFI suggested no difference in the incidence of fetal distress or neonatal mortality, but the rate of caesarean delivery in borderline AFI was reported higher than the rate in normal cases. They evaluated 196 trails of labour with a borderline AFI and 200 women with normal AFI. Meanwhile, in another study, oligohydramniosis was shown to be associated with pregnancy complications but the diminished amniotic fluid volume doesn't seem to have any noticeable effect on 14 anticipating the outcomes.

Therefore, despite so many studies, the predicative accuracy of borderline AFI for an adverse pregnancy outcome is not absolutely definite and prenatal assessment in women with borderline AFI is not recommended. But most findings suggest that even though there is insufficient evidence or indication to begin antenatal testing, the results of borderline AFI should be carefully interpreted, and a diagnostic sonography should be used to confirm SGA and IUGR. More study is needed because of contradictions and insufficient evidence about delivery based on a borderline AFI. The current study aims to compare pregnancy outcomes of a borderline versus normal AFI confounding variables. Also, according to Luo et al the pregnancy outcomes of a borderline versus normal AFI suggested no difference in the incidence of fetal distress or neonatal mortality, but the rate of caesarean delivery in borderline AFI was reported higher than the rate in normal cases. They evaluated 196 trails of labor with a borderline AFI and 200 women with normal AFI . Meanwhile, in another study, oligohydramniosis was shown to be associated with pregnancy complications but the diminished amniotic fluid volume doesn't seem to have any noticeable effect on anticipating the outcomes.

Therefore, despite so many studies, the predicative accuracy of borderline AFI for an adverse pregnancy outcome is not absolutely definite and prenatal assessment in women with borderline AFI is not recommended. But most findings suggest that even though there is insufficient evidence or indication to begin antenatal testing, the results of borderline AFI should be carefully interpreted, and a diagnostic sonography should be used to confirm SGA and IUGR. More study is needed because of contradictions and insufficient evidence about delivery based on a borderline AFI.

AIM AND OBJECTIVES

1) To study pregnancy outcome in borderline oligohydramnios.
2) To evaluate the value of AFI in predicting birth weight, fetal distress, meconium aspiration, fetal growth restriction, NICU admission.
3) The mode of delivery and maternal morbidity among these patients.
4) To evaluate fetomaternal risks associated with borderline amniotic fluid index: AFI 5 to 8 cm.

MATERIALS AND METHODS

This case-control study was conducted on pregnant women who came to IPGMER AND SSKM HOSPITAL between 2020 and 2023. Women with a singleton pregnancy with more than 34 completed weeks of gestation was included in this study and outcomes was studied retrospectively after delivery. The gestational age was calculated from the first day of the last menstrual period or was calculated by sonography before 12 weeks of gestation. Exclusion criteria was premature rupture of membranes, meconium aspiration, uterine anomalies and vaginal bleeding. Normal amniotic fluid volume and borderline amniotic fluid is defined as 8<AFI<24 and 5<AFI<8, respectively, and at least two sonographic assessments after 28 week will required to confirm borderline AFI . Adequate information was obtained by the data within the patients' medical record and factors such as gestational age, number of births, number of pregnancies, pregnancy with diabetes, high blood pressure(blood pressure >140 mmHg systolic and/or >90 mmHg diastolic, twice, at least 6 hours apart or not more than one week apart), preeclampsia, pregnancy and prenatal outcomes (Intrapartum fetal distress, preterm birth or birth under 37 weeks, induction, 5-minute Apgar score, birth weight, ICU admission and fetal growth restriction) was analyzed and recorded.

Study Setting:
Women attending the outdoor patient department, emergency department and indoor patients of department of Gynaecology and Obstetrics of IPGMER AND SSKM hospital.

Group A-CASES n=40
Group B-CONTROL n=40

Study Period:
From 2020 to 2023

Definition Of Case Studies:
1. BORDERLINE AFI- It refers to an AFI between 5 and 8 cm (Magann, 2011; Petrozella, 2011)
2. NORMAL AFI-It refers to AFI between 8cm and 24 cm.

Study Variables:
Maternal age, parity, gestational age, birth weight, mode of delivery, color of liquor, indication of caesarean section, IUGR, Fetal congenital anomalies, apgar score ,meconium aspiration, NICU admission.

Inclusion Criteria:
1) Singleton pregnancy.
2) AFI between 5.1 to 8 cm
3) Antenatal mothers after 34 completed weeks of gestation.

Exclusion Criteria:
1) Medical comorbidities like diabetes, hypertension, hypothyroidism.
2) Preeclampsia
3) Multiple pregnancies
4) Premature rupture of membrane and Preterm premature rupture of membrane.
5) Any congenital anomaly.
6) Any malpresentation.

Sample Size:
Addisu D, Asres A, Gedefaw G, Asmer S. Prevalence of meconium stained amniotic fluid and its associated factors among women who gave birth at term in Felege Hiwot comprehensive specialized referral hospital, North West Ethiopia: a facility based cross-sectional study. BMC pregnancy and childbirth. 2018 Dec;18(1):1-7.

Statistical Software
Sample size has been calculated with help of Epi Info (TM) 3.5.3. EPI INFO which is a trademark of the Centers for Disease Control and Prevention (CDC). For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS 27.0. and Graph Pad Prism version 5. Data had been summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables. Unpaired proportions were compared by Chi-square test or Fischer's exact test, as appropriate. Two-sample t-tests for a difference in mean involved independent samples or unpaired samples. p-value ≤ 0.05 was considered for statistically significant.

Sample Size Justification
- One study found that prevalence of amniotic fluid indexwas 17.8%. So for this study p=0.178.
- Thus the number of patients required for this study was 80.1~ 80 with power 87%.
- The formula used for sample size calculation was as follows:-
- n = 4pq / (L2)
- Where, n= required sample size,
- p= 0.178 (as per the study by Addisu D et al),
- q = 1 – p,
- L = Loss % (Loss of information)

Calculation:
- Here p= 0.178,
- q=1-p = 1-0.178=0.822,
- 4pq = 4 x 0.178 x 0.822 = 0.5853
- L2 = 0.0073
- L= 0.0854
- Loss of information percentage = 8.54%
- n = 4pq / (L2) = 0.5853/0.0073= 80.1= 80

Study Group:
- 80 patients were taken and divided in two groups
- Group-A 40 patients(cases)
- Group-B 40 patients(controls)

Table 1: Association between MODE OF DELIVERY: Group

Group			
Mode Of Delivery	Group-A	Group-B	Total
Forceps VD Row % Col %	5 41.7 12.5	7 58.3 17.5	12 100.0 15.0
LUCS Row % Col %	22 62.9 55.0	13 37.1 32.5	35 100.0 43.8
VBAC Row % Col %	1 100.0 2.5	0 0.0 0.0	1 100.0 1.3
VD Row % Col %	12 37.5 30.0	20 62.5 50.0	32 100.0 40.0
Total Row % Col %	40 50.0 100.0	40 50.0 100.0	80 100.0 100.0

- In Group-A, 22 (55%) patients had LUCS and 18(15.0%) patients had VD(45%) (vd and forceps vd).
- In Group-B, 13(32.5%) patients had LUCS and 27(67.5%)patients had vd(forceps vd and vd)
- Association of Mode Of Delivery with group was statistically significant (p=0.0036).
- VD=vaginal delivery.

Table 2: Association between FETAL DISTRESS/MECONIUM STAINED LIQUOR: Group

Group			
Fetal Distress/Meconium Stained Liquor	Group-A	Group-B	Total
Fetal Distress Row % Col %	8 53.3 20.0	7 46.7 17.5	15 100.0 18.8
Fetal Distress, Meconium Stained Liquor Row % Col %	1 100.0 2.5	0 0.0 0.0	1 100.0 1.3
Meconium Stained Liquor Row % Col %	7 87.5 17.5	1 12.5 2.5	8 100.0 10.0
No Row % Col %	24 42.9 60.0	32 57.1 80.0	56 100.0 70.0
Total Row % Col %	40 50.0 100.0	40 50.0 100.0	80 100.0 100.0

- In Group-A, 8 (20.0%) patients had Fetal Distress,1 (2.5%) patient had Fetal Distress, Meconium Stained Liquor and 7 (17.5%) patients had Meconium Stained Liquor.
- In Group-B, 7 (17.5%) patients had Fetal Distress and1 (2.5%) patient had Meconium Stained.
- Association of Fetal Distress/Meconium Stained Liquor with group was statistically significant (p=0.0370).

Table3: Association between NICU/SNCU: Group

Group			
NICU/SNCU	Group-A	Group-B	Total
NICU Row % Col %	5 55.6 12.5	4 44.4 10.0	9 100.0 11.3
No Row % Col %	22 44.9 55.0	27 55.1 67.5	49 100.0 61.3
SNCU Row % Col %	11 55.0 27.5	9 45.0 22.5	20 100.0 25.0
Yes Row % Col %	2 100.0 5.0	0 0.0 0.0	2 100.0 2.5

Total	40	40	80
Row %	50.0	50.0	100.0
Col %	100.0	100.0	100.0

Association of NICU/SNCU with group was not statistically significant (p=0.4200).

Table 4: Distribution of mean BWT: Group

		Number	Mean	SD	Minimum	Maximum	Median	p-value
BWT	Group-A	40	2.4938	.4371	1.4000	3.8000	2.4500	0.5884
	Group-B	40	2.5525	.5257	1.5000	3.3000	2.7000	

- Distribution of mean BWT with Group was not statistically significant (p=0.5884)
- BWT-Birth weight

Table 5: Distribution of mean APGAR 1 MIN: Group

		Number	Mean	SD	Minimum	Maximum	Median	p-value
Apgar 1 min	Group-A	40	7.3500	.9487	5.0000	8.0000	8.0000	0.0006
	Group-B	40	8.0000	.6151	6.0000	9.0000	8.0000	
Apgar 5 min	Group-A	40	8.3000	.9115	6.0000	9.0000	9.0000	0.2696
	Group-B	40	8.5000	.6472	7.0000	9.0000	9.0000	

Apgar 1 min

Distribution of mean Apgar 1 min with Group was statistically significant (p=0.0006).

Apgar 5 min

Distribution of mean Apgar 5 min with group was not statistically significant (p=0.2696).

SUMMARY AND CONCLUSION

- GROUP A =cases n=40 ;GROUP B-controls n=40
- In our study, out of 80 patients, most of the patients were 21-30years of age. Age was not statistically significant with group.
- Association of Gravida/Parity with group was not statistically significant.
- We found that, most of the patients were Class 12 pass in Group-B compared to Group-A but this was not statistically significant.
- It was found that, majority patients had vaginal delivery(forceps vd and vd) in Group-B compared to Group-A which was statistically significant. Most of the patients had no fetal distress/meconium stained liquor in Group-B compared to Group-A which was statistically significant.
- We have seen that, majority number of patients had good follow up at 6week in Group-B compared to Group-A but this was not statistically significant, lower number of patients had live baby outcome in Group-B compared to Group-A but this was not statistically significant.
- We observed that, lower number of patients had NICU/SNCU in Group-A compared to Group-B but this was not statistically significant. Less number of patients had LBW in Group-A compared to Group-B but this was not statistically significant. The mean age was less in Group-A compared to Group-B it was statistically significant.
- In our study, the mean number of ANC was lower in Group-A compared to Group-B though it was not statistically significant, the mean week of termination was higher in Group-A compared to Group-B it was not statistically significant.
- We concluded that poor peripartum outcomes were observed in borderline compared to normal amniotic fluid index after 34 weeks of gestation in a tertiary care hospital.

REFERENCES

1. Karim R, Jabeen S, Pervaiz F, Wahab S, Yasmeen S, Raees M. Decreased amniotic fluid index and adverse pregnancy outcome at term. JPMI 2010; 4: 307-311.
2. Luo X, Huang Y, Liang R. [Analysis of 196 cases of trial of labor with borderline oligohydramnios assessed by ultrasound. *Zhonghua Fu Chan KeZaZhi.* 1988;33:585–587.
3. Locatelli A, Zagarella A, Toso L, Assi F, Ghidini A, Biffi A. Serial assessment of amniotic fluid index in uncomplicated term pregnancies: prognostic value of amniotic fluid reduction. *J Matern Fetal Neonatal Med.* 2004;15:233–236.
4. Kehl S. [Single Deepest Vertical Pocket or Amniotic Fluid Index as Evaluation Test for Predicting Adverse Pregnancy Outcome (SAFE trial): A Multicenter, Open-Label, Randomized Controlled Trial]. Z Geburtshilfe Neonatol. 2018 Feb;222(1):28-30. [PubMed]
5. Lee YJ, Kim SC, Joo JK, Lee DH, Kim KH, Lee KS. Amniotic fluid index, single deepest pocket and transvaginal cervical length: Parameter of predictive delivery latency in preterm premature rupture of membranes. Taiwan J Obstet Gynecol. 2018 Jun;57(3):374-378.
6. Mousavi AS, Hashemi N, Kashanian M, Sheikhansari N, Bordbar A, Parashi S. Comparison between maternal and neonatal outcome of PPROM in the cases of amniotic fluid index (AFI) of more and less than 5□ cm. J Obstet Gynaecol. 2018 Jul;38(5):611-615. [PubMed]
7. Blitz MJ, Rochelson B, Stork LB, Augustine S, Greenberg M, Sison CP, Vohra N. Effect of Maternal Body Mass Index and Amniotic Fluid Index on the Accuracy of Sonographic Estimation of Fetal Weight in Late Gestation. Am J Perinatol. 2018 Nov;35(13):1235-1240.
8. Madendag Y, Madendag IC, Sahin E, Aydin E, Sahin ME, Acmaz G. How Well Do the Popular Ultrasonic Techniques Estimate Amniotic Fluid Volume and Diagnose Oligohydramnios, in Fact? Ultrasound Q. 2019 Mar;35(1):35-38.
9. Cheung CY, Roberts VHJ, Frias AE, Brace RA. Effects of maternal western-style diet on amniotic fluid volume and amnion VEGF profiles in a nonhuman primate model. Physiol Rep. 2018 Oct;6(20):e13894.