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Original Research Article

Study of perinatal outcomes in normal and borderline oligamnios

Divya R. Prasad*, Neelima V. Nair

Department of Obstetrics and Gynecology, Sree Gokulam Medical College and Research Foundation, Venjaramoodu, Trivandrum, Kerala, India

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***Correspondence:**

Dr. Divya R. Prasad,

E-mail: ms.divanil@rediffmail.com

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ABSTRACT

Background: Oligamnios is a common cause of perinatal mortality and morbidity, but the outcome of borderline oligamnios, defined as Amniotic Fluid Index (AFI) between 5 and 8, is less clear. This study aims to find out the effect of borderline oligamnios on perinatal outcomes in pregnancies beyond 37 weeks.

Methods: An observational prospective study of 131 antenatal mothers with AFI between 5 and 8, after 37 weeks of gestation was conducted in Sree Gokulam Medical College and Research Foundation from October 2017 to September 2019. These observations were compared with that of 131 antenatal mothers with normal AFI beyond 37 weeks of gestation. The observations according to fetal heart rate abnormalities, meconium staining of amniotic fluid, mode of delivery, low birth weight babies, APGAR score, the need of neonatal intensive care unit (NICU) admissions due to neonatal complications were statistically analysed.

Results: Both groups were comparable with respect to age, parity and gestational age. In those with borderline oligamnios, fetal heart rate abnormality was seen in 21% (28), meconium stained amniotic fluid in 18% (23), 70% (91) delivered vaginally and 30% (40) underwent caesarean section, 31% (41) babies weighed below 2.5 kg and 21% (27) neonates needed NICU admissions. In those with normal AFI, none showed fetal heart rate abnormality, 2% (3) showed meconium staining, 93% (122) delivered vaginally and 7% (9) underwent caesarean section, 11% (14) babies weighed below 2.5 kg and 3% (4) neonates needed NICU admissions.

Conclusions: Borderline oligamnios is associated with poor perinatal outcome. AFI can be used as an adjunct to other fetal surveillance methods. It helps to identify those infants at risk of poor perinatal outcome.

Keywords: Borderline oligamnios, Fetal distress, Fetal surveillance, Hypertension in pregnancy, Meconium staining, Perinatal outcome, Stillbirths

INTRODUCTION

Amniotic fluid volume represents a balance between outflow and inflow of fluid into the amniotic cavity.¹ The most common intrinsic abnormality encountered clinically is reduced volume of amniotic fluid referred to as oligamnios. Oligamnios is defined as amniotic fluid index (AFI) \leq 5 cm, as originally described by Phelan et al.² AFI between 5 and 8 is defined as borderline oligamnios. The incidence of oligamnios varies from 10 to 15% of all pregnancies.² The common causes of oligamnios are intrauterine growth restriction, (IUGR),

post term pregnancy, congenital anomalies, premature rupture of membranes and twin to twin transfusion syndrome.³ Most cases have no demonstrable cause and are classified as idiopathic or isolated oligamnios. Oligamnios is associated with variety of ominous pregnancy outcomes like fetal distress, low birth weight, perinatal morbidity, perinatal mortality and increased incidence of caesarean section. Various studies have not demonstrated significant perinatal morbidity in isolated oligamnios. The outcome of borderline AFI is less clear. This study aims to find out the perinatal outcome in pregnancies with borderline oligamnios.

Aim of the study was to compare the perinatal outcomes of pregnancies with borderline amniotic fluid index to those with normal AFI.

METHODS

This is an observational prospective study conducted in the department of obstetrics and gynaecology, Sree Gokulam Medical College and Research Foundation for a period of 2 years, from October 2017 to September 2019. A total 131 antenatal mothers with borderline AFI after 37 weeks were compared to 131 antenatal mothers with normal AFI after 37 weeks.

Inclusion criteria

- All pregnant women beyond 37 weeks gestation, admitted in ward and labour room, and having singleton fetus in cephalic presentation, with normal AFI and borderline AFI were included in the study.

Exclusion criteria

- Multiple gestations
- Malpresentations
- Intrauterine growth restriction
- Associated fetal malformations
- Previous caesarean section
- Gestational hypertension, preeclampsia
- Associated medical complications.

Data was collected from all pregnant patients included in the study, using a proforma. Clinical evidence of decreased liquor was looked for and confirmed using ultrasound. These patients were followed up and various outcome measures were recorded which included fetal heart rate tracings, meconium staining of amniotic fluid, mode of delivery, indication for caesarean section, birth weight, APGAR score, admission to NICU and perinatal mortality. Data collected was entered in Microsoft excel and statistically analysed using SPSS software 20. Outcome measures of those with borderline oligamnios was compared with those with normal AFI.

Statistical analysis

The statistical tests used were F test, Chi square test and t-test.

RESULTS

A total 131 pregnant women with AFI >8 cm after 37 weeks gestation was compared with 131 pregnant women with AFI between 5 and 8 after 37 weeks gestation.

These 2 groups were comparable with respect to age, parity and gestational age at the time of delivery.

AFI

The amniotic fluid was measured by four quadrant amniotic fluid assessment technique using ultrasound. The mean AFI for those with borderline AFI was 7.52 cm and that for those with normal AFI was 11.86 cm (Table 1).

Table 1: Distribution of cases according to their AFI.

Borderline AFI	Mean	Normal AFI	Mean
5-5.9	5.6	8.1-10	9.21
6-6.9	6.4	10.1-13	11.55
7-7.3	7.15	13.1-16	14.6
7.4-7.7	7.55	16.1-18	16.8
7.8-8	7.89	18.1-20	18.4
Total	7.52	Total	11.86

*F-value 0.01932, p-value <0.05.

Fetal heart rate (FHR) abnormality

FHR was monitored using cardiotocogram. FHR abnormalities were seen in 21% (28) of those with borderline AFI compared to none in those with normal AFI. Most common fetal heart rate abnormality was variable decelerations which were considered significant if it was below 70 bpm and persisting for more than 60 seconds. There was significant difference between the two groups in occurrence of FHR abnormality (Table 2).

Table 2: Distribution of cases according to the fetal heart rate abnormality.

FHR abnormality	Borderline AFI		Normal AFI	
	Number	%	Number	%
Absent	103	79	131	100
Present	28	21	0	0

*X²-value 31.35, P-value < 0.05.

Meconium staining of amniotic fluid

The amniotic fluid was meconium stained in 18% (23) in those with borderline AFI. In those with normal AFI, only 2 % (3) had meconium stained amniotic fluid (Table 3).

Table 3: Distribution of cases according to the color of liquor.

Colour of liquor	Borderline AFI		Normal AFI	
	Number	%	Number	%
Clear	108	82	128	98
Meconium stained	23	18	3	2

*X²-value 17.92, P-value < 0.05.

Mode of delivery

A total 70% (91) delivered vaginally in those with borderline AFI and 93% (122) in those with normal AFI.

30% (40) women underwent caesarean section in those with borderline AFI, whereas the rate of cs was 7% (9) in those with normal AFI (Table 4). Fetal distress and meconium stained amniotic fluid were the commonest indications for caesarean section.

Table 4: Distribution of cases according to the mode of delivery.

Mode of delivery	Borderline AFI		Normal AFI	
	Number	%	Number	%
Vaginal delivery	91	70	122	93
Caesarean section	40	30	9	7

*X²-test 25.62, p-value < 0.05.

Birth weight

The mean birth weight was 2.90 kg in those with borderline AFI and 3.13 kg in those with normal AFI. The occurrence of birth weight <2.5 kg was seen in 31% (41) and 11% (14) in those with borderline oligamnios and those with normal AFI respectively (Table 5).

Table 5: Distribution of cases according to birth weight of babies.

Birth weight (kg)	Borderline AFI		Normal AFI	
	Number	%	Number	%
< 1.5 kg	0	0	0	0
1.5-2.4 kg	41	31	14	11
2.5-3.4 kg	72	55	90	69
3.5- 4.4 kg	18	14	27	21
Total	131	100	131	100
Mean	2.90		3.13	
SD	0.52		0.4	

p-value <0.05.

Apgar score

The 1-minute Apgar score <9 was seen in 22% (29) neonates of those with borderline AFI and in 3% (4) of those with normal AFI (Table 6).

Table 6: Distribution of cases according to the Apgar score.

Apgar <9	Borderline AFI		Normal AFI	
	Number	%	Number	%
1 minute	29	22	4	3

*X²-test 0.137, p-value 0.711.

NICU admissions

A total 21% (27) neonates of those with borderline AFI were admitted in neonatal intensive care unit for various morbidities like birth asphyxia and meconium aspiration. Only 3% (4) of those with normal AFI were admitted to NICU (Table 7).

There was no incidence of perinatal mortality in both the groups.

Table 7: Distribution of neonates according to their admission to NICU.

Admission to NICU	Borderline AFI		Normal AFI	
	Number	%	Number	%
Yes	27	21	4	3
No	104	69	127	97

*X²-test 19.35, p-value <0.05.

Table 8: Comparison of neonatal complications of various studies.

Studies	Apgar < 9	Low birth weight	NICU admission
Sriya R et al	38.8%	58.38%	88.88%
Guin et al	39%		
Chate P et al	30%	62%	42%
Our study	22%	31%	21%

DISCUSSION

The concept of borderline oligamnios with ultrasound value of amniotic fluid volume between 5 and 8 was originally described by Phelan.² Considering the adverse perinatal outcome in patients with borderline oligamnios and with oligamnios of AFI <5, there is still uncertainty about whether to manage these two groups similarly.

In the present study, both groups were comparable in terms of age, parity and gestational age.

Fetal heart abnormality was seen in 21% (28) of those with borderline oligamnios while no abnormality was found in those with normal AFI. In various studies by Gaikwad PR, it was 27.4%, by Ghike et al, it was 44% and by Dasari et al, it was 23.8%.⁴⁻⁶

Amniotic fluid was meconium stained in 18% of those with borderline oligamnios and 2% of those with normal AFI. The difference is statistically significant. However, different studies seem to show different outcomes. Wood L et al, in their study could not show a statistically significant difference in the meconium staining of amniotic fluid.⁷

A total 70% (91) of those with borderline oligamnios delivered vaginally while 93% (122) of those with normal AFI delivered vaginally. The difference is statistically significant. The caesarean rate in those with borderline oligamnios was 30% (40). Petrozella et al, reported the caesarean rate to be 24% which is similar to our study. Common indications for caesarean section were fetal distress and meconium staining of amniotic fluid.⁸

In addition, the borderline oligamnios group had a higher rate of neonatal complications including 1-minute Apgar

<9, low birth weight babies and NICU admissions. Similar results were seen in the studies by Sriya R et al, Guin et al, and Chate P et al (Table 8).⁹⁻¹¹ The various reasons for NICU admissions included birth asphyxia and meconium aspiration.

No cases of perinatal or neonatal mortality was noted in either of the groups.

An AFI between 5 and 8 cm after 37 weeks of gestation is an indicator of adverse perinatal outcome. A higher rate of FHR abnormality, meconium stained amniotic fluid, fetal distress, increased rates of caesarean section, low Apgar scores, low birth weight babies and NICU admissions were seen in the borderline oligamnios group. So, these patients should be closely monitored during labour using intrapartum surveillance methods in order to avoid poor perinatal outcomes.

CONCLUSION

Borderline oligamnios is associated with poor perinatal outcome. AFI can be used as an adjunct to other fetal surveillance methods. It helps to identify those infants at high risk of poor perinatal outcome.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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