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Perinatal outcome in isolated oligohydramnios in full term pregnancy

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Abstract
Background: Oligohydramnios has traditionally been associated with adverse materno-fetal outcome. Oligohydramnios without having any underlying pathology had been termed as idiopathic oligohydramnios. Management of idiopathic oligohydramnios had remained always a grey area for obstetrician. Before the advent of ultrasound clinicians had to rely on abdominal palpation and fundal measurements to detect abnormal fluid volume. The condition is usually severe when oligohydramnios or polyhydramnios is detected by clinical examination. With the development of ultrasound imaging the amniotic fluid volume assessment has progressed from a stage of subjective impression to the present state in which relatively sophisticated judgements of fetal conditions can be based on reproducible measurements.
Methodology: This study consists of an analysis of pregnancy outcome in 50 cases with diagnosis of oligohydramnios (AFI less than 5) by ultrasound after 37 completed weeks of gestation compared with 50 controls with no oligohydramnios (AFI more than 8) and matched for other variables like age, parity, gestational age and any pregnancy complication.
Results: Idiopathic oligohydramnios is associated with increased risk of LSCS (22%), Meconium stained liquor (18%), neonatal NICU admisisson (4%) and abnormal ctg (6%).
Conclusion: An amniotic fluid index of < 5 cm detected after 37 completed weeks of gestation in a low risk pregnancy is an indicator of poor pregnancy outcome. Determination of AFI can be used as an adjunct to other fetal surveillance methods. Determination of AFI is a valuable screening test for predicting fetal distress in labor requiring cesarean section.

Keywords: Ultrasonography, oligohydramnios, amniotic fluid index, lower segment cesarean section

Introduction
Amniotic fluid plays a major role in the fetal growth and development. It provides the fetus with a protective low resistance environment suitable for growth and development. It provides a cushion against the constricting confines of the gravid uterus, allowing the fetus room for the movement and growth and protecting it from external trauma. It helps to maintain the fetal body temperature and plays a part in the homeostasis of fluid and by permitting extension of the limbs it prevents joint contractures. It prevents compression of the umbilical cord and thus protects the fetus from vascular and nutritional compromise [1].
The abnormalities of the fluid volume can thus interfere directly with fetal development or may be an indirect sign of underlying disorder such as fetal hypoxia, neural tube defect or gastro intestinal obstruction [2].
In the past the discussions of amniotic fluid volume were limited to observations of the quantity of fluid released after rupture of membranes. The occurrence of thick meconium or fetal distress in postdated pregnancies for example was attributed vaguely for placental insufficiency [3].
However the importance of amniotic fluid volume as an indicator of fetal status was appreciated only recently.
Before the advent of ultrasound clinicians had to rely on abdominal palpation and fundal measurements to detect abnormal fluid volume. The condition is usually severe when oligohydramnios or polyhydramnios is detected by clinical examination [4-5]. With the development of ultrasound imaging the amniotic fluid volume assessment has progressed from a stage of subjective impression to the present state in which relatively sophisticated judgements of fetal conditions can be based on reproducible measurements.
In present practice, a semi quantitative amniotic fluid volume assessment during routine

ultrasound examination and ante partum testing has become the standard of care.

The purpose of taking group of women with oligohydramnios at term pregnancies are because the etiology, management and the outcome is different in late onset oligohydramnios compared to early onset oligohydramnios.

Amniotic fluid index of ≤5 cm defines oligohydramnios as, originally described by Phelan *et al*. Many studies show that oligohydramnios is associated with variety of ominous pregnancy outcomes, such as fetal distress, low birth weight, perinatal morbidity, perinatal mortality and increased incidence of caesarean section [6-8].

However, some studies show that amniotic fluid index is a poor predictor of adverse outcome and even the existence of an entity like isolated term oligohydramnios has been questioned by some authors [9-10]. Thus this study is conducted to determine whether an antepartum amniotic fluid index (AFI) of 5 cm or less as a predictor of adverse pregnancy outcome.

Objective of the study

To determine whether an antepartum amniotic fluid index (AFI) of 5 cm or less as a predictor of adverse pregnancy outcome in terms of:

- Onset of labour
- Mode of delivery
- Occurrence of abnormal FHR pattern/fetal distress
- Neonatal morbidity and mortality

Methodology

This study consists of an analysis of pregnancy outcome in 50 cases with diagnosis of oligohydramnios (AFI less than 5) by ultrasound after 37 completed weeks of gestation compared with 50 controls with no oligohydramnios (AFI more than 8) and matched for other variables like age, parity, gestational age and any pregnancy complication.

The study and control group consist of women admitted to Govt. medical college Rajnandgaon. This is a Cohort study done over a period of 22 months (November 2015 to September 2017). All the cases that were available up to the study period have been taken for the purpose of study.

For all the selected cases, thorough history was taken and complete examination was done. Clinical evidence of oligohydramnios was looked for. The previous obstetric records and ultrasound reports were reviewed.

Only those women who remembered their date of last menstrual period correctly with previous regular cycles and the gestational age calculated by clinical examination and ultrasound were corresponding were taken for study. So, only the good dates and excellent dates women with thirty seven completed weeks of gestation were studied. For all the women, ultrasound examination was done and amniotic fluid index was calculated by four quadrant amniotic fluid volume measurement technique.

For all women baseline investigations like Hb%, blood group and Rh typing, urine examination were done. NST was done for all patients.

Oligohydramnios is defined as amniotic fluid index < 5 cm. The amniotic fluid volume is considered normal if amniotic fluid index is between 5.1 an 20 cm. Those with ruptured membranes and other complications like multiple pregnancy, malpresentation which could alter the results were excluded from the study. For each case a control was taken with similar gravidity, parity, gestational age but the amniotic fluid index of more than 8 cm and less than 20 cm.

Inclusion criteria

1) AFI less than or equal to 5
2) Single live intrauterine gestation with cephalic presentation
3) 37 completed weeks of gestation
4) Intact membrane

Exclusion criteria

1) AFI more than 5
2) Gestational age less than 37 completed weeks.
3) Post term
4) Associated fetal malformations.
5) Ruptured membranes
6) Malpresentation and multiple gestations.
7) Placental insufficiency
8) Hypertension
9) Preeclampsia
10) Diabetes
11) Hypovolemia
12) chronic renal disease
13) connective tissue disorders
14) Abruption
15) Prostaglandin synthetase inhibitors therapy
16) Angiotensinogen converting enzyme inhibitors therapy
17) Uterine scar due to Previous LSCS, myomectomy , hysterotomy.
18) The pregnancies with fetal malformations were also excluded from the study.

Results

Table 1: Distribution of Study group based on Amniotic Fluid Index

AFI	Numbers	Percentage
0– 1 cms	09	18%
1– 2.0 cms	10	20%
2.1 – 3 cms	06	12%
3.1– 4.0 cms	09	18%
4.1- 5.0 cms	16	32%
Total	50	100%

Table 2: Distribution of controls based on Amniotic Fluid Index

AFI	Number	Percentage
8.0 – 10.0 cms	27	54%
10.1 – 12.0 cms	13	26%
12.1 – 14.0 cms	07	14%
> 14.0 - <20 cms	03	06%
Total	50	100%

Table 3: Distribution of study subjects based on admission to NICU

NICU admission	Study group (n=50)	Controls (n=50)	Total	
Yes	02 (04.0%)	00 (00.0%)	02	(02%)
No	48 (96.0%)	50 (100.0%)	98	(98%)
Total	50 (100%)	50 (100%)	100	(100%)

2 neonates (4%) of study group were admitted to neonatal ward for morbidities like birth asphyxia and meconium aspiration. No control group were admitted to neonatal ward.

Table 4: Distribution of study subjects based on mode of delivery

Mode of delivery	Study group (n=50)	Controls (n=50)	Total	
FTND	14 (28.0%)	30 (60.0%)	44	(44%)
FTVD	25 (50.0%)	18 (36.0%)	43	(43%)
LSCS	11 (22.0%)	02 (04.0%)	13	(13%)
Total	50 (100%)	50 (100%)	100	(100%)
Chi-square – 13.18 df-	2	p value – 0.001 (significant)		

Number of women delivered by LSCS was 11(22%) among study group compared to 2(4%) in control group. There was statistical significant difference among two groups in this category. (p-0.001).

Table 5: Distribution of study subjects based on fetal heart rate pattern:

FHR pattern	Study group (n=50)	Controls (n=50)		Total	
Early decelerations	01 (02.0%)	00	(0%)	01 (1%)	
Late decelerations	01 (02.0%)	00	(0%)	01 (1%)	
Variable decelerations	02 (04.0%)	00 (0%)		02 (2%)	
No	46 (92%)	50 (100%)		96	(96%)
Total	50 (100%)	50 (100%)		100	(100%)

Most common FHR abnormality included variable decelerations found in 2(4%) woman in study group. Late deceleration in 1 (2%) of women of study group. In the control group no fetal heart rate decelerations were found.

Table 6: Distribution of study subjects based on nature of amniotic fluid

Amniotic fluid	Study group (n=50)	Controls (n=50)	Total	
Clear	41 (82.0%)	46 (92.0%)	87	(87%)
Meconium stained	09 (18.0%)	04(08.0%)	13	(13%)
Total	50 (100%)	50 (100%)	100	(100%)

The amniotic fluid was meconium stained in 9 (18%) and clear in 41 (82%) women in study group. In control group, only 4 (8%) women had meconium stained amniotic fluid and 46 (92%) had clear amniotic fluid.

Discussion

A cohort study conducted in Govt. Medical College Rajnandgaon, which contains of analysis of Pregnancy outcome of term isolated oligohydramnios and normal term pregnancies after matching the demographic variables.

The various outcome results are compared with results of similar studies done both in India and abroad.

Admission to neonatal ward

Four percent of newborns were admitted in neonatal ward for various morbidities like birth asphyxia, meconium aspiration etc. It is comparable to studies conducted by Magann *et al* (7.6%) and Casey *et al* (7%).

Studies by Chandra P *et al* and Sriya R *et al* showed high incidence of NICU admission ie 46.15% and 88.88% respectively.

Among cases and controls there were no neonatal death.

Occurrence of meconium stained liquor

The occurrence of meconium stained amniotic fluid is high in women with AFI < 5 cm. The meconium stained liquor was noted in 18% in study group in present study which is comparable to study conducted by Chandra P *et al.* (23.7%). The studies by Rutherford *et al.* and Sriya R *et al.* had meconium stained liquor about 54% and 38.88% respectively. In a study by Grubb *et al.* 99% of women with AFI <5 cm and prolonged deceleration, had meconium stained liquor.

According our study protocol meconium stained liquor cases were taken up for emergency LSCS.

LSCS for fetal distress

Various studies show different rates of LSCS for fetal distress in pregnant women with amniotic fluid index of <5 cm. The LSCS for fetal distress was done in 22% in present study which is compared with the situations in other studies. The LSCS rates were 76.92%, 51%, 43.93% respectively with study conducted by Chandra P *et al*, Casey *et al*, Sriya P *et al*. Oligohydramnios (AFI <5 cm) has been used as a screening test for the development of fetal distress, subsequently during intrapartum period [11].

Including only isolated oligohydramnios cases in our study may be the cause for decrease in LSCS rates for fetal distress.

FHR Decelerations

The FHR decelerations, during intrapartum period suggestive of fetal distress are common in pregnant women with AFI < 5 cm. Most common are variable decelerations due to cord compression. The ominous FHR pattern noted in 8% in present study is less compared to 48% and 36.11% in studies by Casey *et al*. and Sriya R. *et al*. respectively [12-13].

Conclusion

An amniotic fluid index of < 5 cm detected after 37 completed weeks of gestation in a low risk pregnancy is an indicator of poor pregnancy outcome.

In presence of oligohydramnios, the occurrence of non reactive NST, abnormal FHR tracings during labor, thick meconium stained liquor, development of fetal distress, the rate of LSCS, are high. In our study the rate of LSCS, meconium stained liquor, non reactive NST, abnormal FHR tracing during labour, development fetal distress, NICU admission are more.

Determination of AFI can be used as an adjunct to other fetal surveillance methods Determination of AFI is a valuable screening test for predicting fetal distress in labor requiring cesarean section.

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