

## Study of oligohyramnios & its perinatal outcome

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### Abstract

**Objective:** To study and analyse the neonatal outcome and appropriate route of delivery in oligohydramnios of AFI < 5 cm at or beyond 34 weeks gestation.

**Methods:** In this prospective case control study of 50 women (study group) with ultrasound diagnosis of oligohydramnios of AFI < 5 cm at or beyond 34 weeks of gestation was compared with 50 women (control group) with AFI > 5 cm and less than 25 at or beyond 34 weeks matched for age, parity, gestational age. Women with PROM, gestational age < 34 weeks and greater than 40 weeks, congenital anomaly, PIH, multiple gestations were excluded from this study. Pregnancy was assessed with respect to antepartum, intrapartum and neonatal outcome measures.

**Results:** In our study we found that oligohydramnios was associated with increased rate of non reassuring fetal heart rate (20% Vs 4%), labor induction (28% Vs 2%), cesarean delivery (56% Vs 8%), low birth weight (62% Vs 24%), IUGR (18% Vs 2%) and admission to NICU (18% Vs 4%). No difference in occurrence of meconium stained liquor, Apgar score < 7 at 5 minutes was found. There was no neonatal death in the study.

**Conclusion:** Pregnancies with isolated oligohydramnios (AFI < 5 cm) at or beyond 34 weeks are associated with increased incidence of fetal distress (non reassuring fetal heart rate), cesarean delivery, and low birth weight. Induction of labor was associated with increased rate of caesarean section for fetal distress. No appropriate route of delivery can be recommended for isolated oligohydramnios.

**Keywords:** Oligohydramnios, Fetal distress, Labor induction, Caesarean delivery.

### Introduction

Importance of amniotic fluid volume as an indicator of fetal status was appreciated relatively recently.<sup>(1)</sup> Amniotic fluid has a number of important roles in embryo/ fetal development. It cushions that fetus against trauma, has antibacterial property and promotes growth and development of gastrointestinal and musculoskeletal system.<sup>(2)</sup> It helps to maintain the fetal body temperature and plays a part in the homeostasis of fluid, and permits fetal movements.<sup>(2,3)</sup> Amniotic fluid volume maintains amniotic fluid pressure there by reducing the loss of lung fluid- an essential component to pulmonary development. It prevents compression of the umbilical cord.<sup>(4)</sup> Decreased amniotic fluid volume is frequently one of the first clues to an underlying fetal abnormality or maternal disease state.<sup>(5)</sup> A significant reduction in the amount of amniotic fluid co-relates with an increased rate of both perinatal morbidity and perinatal mortality.<sup>(5)</sup> Before the advent of ultrasound clinicians had to rely on abdominal palpation and fundal height measurements to detect abnormal fluid volume. The progressive improvements in ultrasonographic imaging have taken the technology of fetal and amniotic fluid assessment from the stage of subjective impression to present state in which relatively sophisticated judgment of fetal condition can be based on reproducible measurements. In present practice, semi quantitative amniotic fluid volume assessment during routine ultrasound examination and ante partum testing has become standard of care. Most common quantitative

measure used in clinical practice is AFI. It is calculated by dividing the uterus externally into 4 quadrants and using ultrasound to measure vertical diameter of the largest pocket in each quadrants and using ultrasound to measure vertical diameter of the largest pocket in each quadrant in millimeter, which is then summed to calculate AFI.<sup>(6)</sup> AFI < 5 cm is the accepted cut off for the diagnosis of oligohydramnios. Ante partum diagnosis of oligohydramnios by means of AFI accounted for 2.3% of pregnancies undergoing sonography after 34 weeks.<sup>(7)</sup> Sonogram – assisted diagnosis of oligohydramnios is associated with increased pregnancy intervention, still birth, fetal heart rate deceleration during labor and increased neonatal morbidity and mortality rates.<sup>(7)</sup> Oligohydramnios can be an idiopathic finding in women who have low risk pregnancies and no medical or fetal complication.<sup>(25)</sup> The present study was designed to study the outcome of pregnancies with AFI ≤ 5 cm at or beyond 34 weeks.

### Material and Method

This is a prospective case control study done in the department of Obstetrics and Gynecology of Dr. V.R.K. Women's Medical College, Aziz Nagar from January 2013 to May 2015. The Study consists of analysis of pregnancy outcome in 50 cases of antenatal patients with the ultrasound diagnosis of oligohydramnios (AFI ≤ 5) at or beyond 34 weeks of gestation compared with 50 controls with normal liquor (AFI > 5 and < 25) and matched for other variable like age, parity and gestational age. The study and control group consist of

pregnant women at or beyond 34 weeks of gestation admitted to the antenatal ward up to delivery.

## Results

The mean age in study was 22.6 years. Most of them were primigravida's and the mean gravidity was 1.78 in the study. The amniotic fluid index was measured by four quadrant semi quantitative technique. The mean AFI in the study was 3.74cm. The occurrence of non reactive NST was more common in the study group compared to control group (20% Vs 4%). The FHR deceleration in CTG were recorded more often in oligohydramnios group and variable deceleration were the common type (36% Vs 4%). There was no difference in occurrence of meconium stained amniotic fluid in the present study. The incidence of induction of labor was more in the study group, compared to control group (28% Vs 2%). The difference was statistically significant ( $P < 0.05$ ). There was an increase in incidence of cesarean delivery (56%) in women with oligohydramnios. There was increased incidence of cesarean delivery for fetal distress in induced women. There was no difference in the occurrence of Apgar score less than 7 at 1 min and 5 min both in term and preterm babies. Incidence of IUGR in the study was 18%. The mean birth weight was 2.4kg in the present study. The birth weight  $\leq 2.5$ kg was seen in 62% of women in the study. The incidence of low birth weight was high even in women with term gestation. 18% of babies born in study group were admitted to neonatal ward for various neonatal complications like meconium aspiration, preterm birth, IUGR and birth asphyxia. There were no early neonatal deaths in the present study. No appropriate route of delivery for isolated oligohydramnios can be recommended by our study.

## Discussion

Importance of amniotic fluid volume as an indicator of fetal status was appreciated relatively recently.<sup>(1)</sup> In the present study, the amniotic fluid

volume was assessed by Ultrasonography using amniotic fluid index.

The various outcome measures recorded were, induced Vs spontaneous labor, gestational age at delivery, nature of amniotic fluid, FHR tracing, mode of delivery, indication for caesarean section or instrumental delivery, Apgar score at one minute and five minute, birth weight, admission to neonatal ward perinatal morbidity and mortality.

The mean age for the study group in the present study was 22.6 years which is comparable with Elizabeth G.Voxman<sup>(16)</sup> and Brian M. Casey et al,<sup>(7)</sup> 27.3 yrs and 23.9 yrs respectively.

The mean parity is 0.68 comparable with that of mean parity of 0.6 in the study by Magann et al<sup>(12)</sup> and mean parity of 1 in a study by Collen B et al.<sup>(9)</sup>

The mean gestational age in the present study was 38.1 weeks comparable with 37.5 weeks in a study by Brian. M Casey et al.<sup>(7)</sup>

The mean AFI in the present study was 3.74cm comparable with a study by Elizabeth G Voxmann<sup>(16)</sup> of 3.2cm.

The rate of non-reactive NST in present study is 20% vs 40% in Kumar P et al<sup>(23)</sup> and 5.9% in Elizabeth G. Voxman.<sup>(16)</sup>

FHR pattern was noted in 38% of women in present study which is comparable to 36.11% and 48% in studies by Sriya R et al<sup>(24)</sup> and Casey et al<sup>(7)</sup> respectively.

Meconium stained liquor was noted 22% in present study compared with 16% in Kreiser D et al<sup>(14)</sup> and 6% in Casey et al.<sup>(7)</sup>

In the present study 14 women (28%) in study group were induced. Compared to Casey et al<sup>(7)</sup> the rate of induction was 42%, Rainford et al<sup>(15)</sup> it was as high as 98%, and Kreiser et al<sup>(14)</sup> 7%.

In the present study 36% of women underwent LSCS for fetal distress compared with Rainford et al<sup>(15)</sup> which is 21%.

## Mode of delivery

Mode of delivery	Study Group		Control Group	
	Number	Percentage	Number	Percentage
Full term normal vaginal deliver	15	30	41	82
PVD	6	12	5	10
LSCS	28	56	4	8
Instrumental vaginal delivery	1	2	0	0
Total	50	100	50	100

## Intervention for fetal distress LSCS for fetal distress in non-reactive NST

Intervention	Study Group		Control Group	
	Number	Percentage	Number	Percentage
LSCS	18	36	2	4
Instrumental Vaginal	1	2	0	0

delivery				
Total	19	38	2	4

Groups	Non-reactive NST	LSCS	Percentage
Study	10	9	90
Control	2	2	100

**LSCS for fetal distress in reactive NST**

Groups	Reactive NST	LSCS	Percentage
Study	40	8	20
Control	49	0	0

**APGAR Score < 7**

Apgar Score	Study Group		Control Group	
	Number	Percentage	Number	Percentage
1 minute	19	38	13	26
5 minute	5	10	2	4

**Mode of delivery**

Studies	Rate of LSCS in oligohydramnios
ElizabethG.Voxman <sup>(16)</sup>	16
Casey et al <sup>(7)</sup>	32
Garmel et al <sup>(10)</sup>	35.2
Danon et al <sup>(26)</sup>	17
Present study	56

**Mode of delivery**

Studies	Percentage of induced labor
Rainford et al <sup>(15)</sup>	98
Casey et al <sup>(7)</sup>	42
Kreiser et al <sup>(14)</sup>	7
Present study	28

**FHR deceleration**

Studies	Percentage of LSCS for fetal distress
Casey et al <sup>(7)</sup>	5
Kreiser et al <sup>(14)</sup>	7
Rainford et al <sup>(15)</sup>	21
ElizabethG.Voxman <sup>(16)</sup>	9.7
Locatelli A et al <sup>(17)</sup>	8.2
Corosu R et al <sup>(13)</sup>	66%
Present study	36

Studies	% of FHR deceleration
Present study	38
Sriya R et al <sup>(24)</sup>	36.11
Casey et al <sup>(7)</sup>	48

**Nature of Amniotic fluid**

Studies	% of meconium stained amniotic fluid
Kreiser D et al <sup>(14)</sup>	16
Rainfor et al <sup>(15)</sup>	35
Casey et al <sup>(7)</sup>	6
Present study	22

**Non-reactive non stress test**

Studies	Percentage of non-reactive NST
Kumar P et al <sup>(22)</sup>	40
Chandra P et al <sup>(23)</sup>	69.23
Sriya R et al <sup>(24)</sup>	41.55
Elizabeth G. Voxman <sup>(16)</sup>	5.9
Present study	20

Apgar score < 7 at 5 minutes was 10% in the study group. Casey et al<sup>(7)</sup> found no difference in incidence of low Apgar scores at 5 min (<7). The rates of low Apgar score were similar between the pregnancies in study and control group. Our study results were consistent with the inference by various author like Rainford et al,<sup>(15)</sup> Kreiser D et al,<sup>(14)</sup> Locatelli a et al<sup>(17)</sup> and Elizabeth G. Voxman et al.<sup>(16)</sup>

The occurrence of low birth weight babies less than 2.5kg was 62% which is comparable with other studies like Chandra P et al<sup>(23)</sup> (61.53%) and Sriya R et al<sup>(24)</sup> (58.38%). The occurrence of low birth weight babies were significantly high even in women with term gestation.

In present study the rate of occurrence of IUGR was 18%. Compare to Corosu R et al<sup>(13)</sup> 39.59% and 24.5% in Golan A et al.<sup>(8)</sup>

18% of newborn were admitted to the neonatal intensive care unit for various morbidities like meconium aspiration, birth asphyxia, IUGR and preterm care. This is not consistent with studies by Magann et al<sup>(12)</sup> – 7.6%, Casey et al<sup>(7)</sup> – 7%, and Sriya R et al<sup>(24)</sup> – 88.88%.

There were no cases of neonatal death in our study. No neonatal mortality was seen in a study by Garmel et al<sup>(10)</sup> and Casey et al.<sup>(7)</sup>

**Conclusion**

Pregnancies with isolated oligohydramnios (AFI ≤ 5) at or beyond 34 weeks is associated with increased rate of non reactive NST, FHR deceleration during labor, development of fetal distress, rate of caesarean delivery and low birth weight. Rate of caesarean for fetal distress is increased because of increased rate of induction of labor in the women with oligohydramnios. Routine induction of labor for isolated oligohydramnios

is not recommended. No appropriate route of delivery can be recommended by this study. It is preferable to allow patients to go into spontaneous labor with continuous fetal heart rate monitoring. Termination of pregnancy with oligohydramnios by caesarean delivery or instrumental vaginal delivery to be done at the onset of fetal distress. Antepartum diagnosis of oligohydramnios warrants close fetal surveillance.

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