

# Clinical study of Maternal and perinatal outcome in oligohydramnios in term patients at a tertiary care institute

A Sreedevi<sup>1\*</sup>, S V V Naga Raja Mannar<sup>2</sup>

{<sup>1</sup>Associate Professor, Department of Obstetrics & Gynaecology} {<sup>2</sup>Professor & HOD, Department of Anatomy} Government Medical College & General Hospital. Ongole. Andhra Pradesh, INDIA.

Email: [asyspoo664@gmail.com](mailto:asyspoo664@gmail.com)

## Abstract

**Background:** Estimation of amniotic fluid volume is a part of routine obstetric scan. Oligohydramnios can be defined as amniotic fluid volume <5% for gestational age, AFI<5 cm or maximal deepest pocket<2 cm. In present study maternal and perinatal outcome associated with oligohydramnios in a tertiary care hospital was studied. **Material and Methods:** Present study was a hospital-based, observational study conducted in pregnant woman with confirmed gestational age  $\geq 37$  weeks, intact membranes, singleton gestations, AFI < 5 cms and/or single vertical pocket is < 2 centimeters. **Results:** Total 110 patients were included in present study. Most common age group in our study was of 21- 25 years (40 %), followed by 26-30 years age group (20.91 %). Mean maternal age in present study was  $24.88 \pm 6.11$  years. 60 % patients in our study were nullipara, 23.64 % were primipara. 39-40 weeks gestational age (35.45 %) was most common group in present study. Oligohydramnios in term patients was associated with other antenatal complications such as prolonged pregnancy (40-42 wks.) (27.27 %), gestational hypertension (14.55 %), preeclampsia (10 %), breech (8.18 %) and anaemia (6.36 %). 53.64 % patients had none complications/high risk factors. Most patients had AFI 4-5 cm (59.09 %), while AFI 2-3 cm was noted in patients 26.36 % and 14.55 % patients had AFI 0-2 cm. The mean amniotic fluid index in our study was  $3.38 \pm 1.24$  cm. Spontaneous onset of labour was noted in 50.91% patients, while induction of labour was required in 33.64% and 15.45% patients underwent elective LSCS. In present study mode of delivery was vaginal (64.55%), LSCS (30.91%) and Instrumental delivery (4.55%) Fetal distress (32.35 %) was most common indication for LSCS, followed by malpresentation (17.65 %), failed induction/non-progress of labour (NPL) (14.71 %) and unfavourable cervix (14.71 %). In present study 2.5-3.49 kg birthweight was most common (54.55%). 20 % babies required neonatal resuscitation. and 20.91 % babies needed NICU admission during study period. Majority of them were birthweight less than 2000 gm, meconium aspiration, cord looped around neck etc. We noted stillbirth in 1 case and early neonatal death in 3 babies. No maternal mortality was noted. **Conclusion:** In pregnant women with oligohydramnios, high incidence of meconium-stained liquor, fetal distress, need of LSCS, low Apgar score, low birth weight, perinatal morbidity and mortality noted. Evaluation of AFI should be used as an adjunct to other fetal surveillance methods to identify infants at risk of poor perinatal outcome. **Keywords:** oligohydramnios, meconium-stained liquor, fetal distress, LSCS, low Apgar score.

## \*Address for Correspondence:

Dr A Sreedevi, Associate Professor, Department of Obstetrics & Gynaecology. Government Medical College & General Hospital. Ongole. Andhra Pradesh, INDIA.

Email: [asyspoo664@gmail.com](mailto:asyspoo664@gmail.com)

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## INTRODUCTION

Estimation of amniotic fluid volume is a part of routine obstetric scan. Oligohydramnios can be defined as amniotic fluid volume <5% for gestational age, AFI<5 cm or maximal deepest pocket<2 cm. Measurement of single deepest pocket is the best method for diagnosing oligohydramnios; however, most studies evaluating adverse outcomes utilize AFI.<sup>1</sup> During pregnancy, amniotic fluid provides a protected environment for the growing fetus. It acts as a shock absorber, maintains even

temperature, allows for growth and free movement of the fetus and prevents adhesion between fetal parts and amniotic sac. During labour, the amnion and chorion are combined to form a hydrostatic wedge which helps in dilatation of cervix, it guards against umbilical cord compression.<sup>2</sup> It has been proposed that amniotic fluid possesses certain bacteriostatic properties that protect against potential infectious processes and that a decrease in amniotic fluid volume may impair the gravid woman's ability to combat such infections.<sup>3</sup> Validated non-invasive methods include the four-quadrant amniotic fluid index (AFI), single deepest pocket (SDP) and two-diameter pocket.<sup>4</sup> Oligohydramnios is associated with increased maternal morbidity in terms of increase rate of induction of labour, prolonged labour and caesarean section. Adverse perinatal outcomes such as preterm delivery, low birth weight, fetal distress in labour, meconium passage, low Apgar score, neonatal resuscitation and NICU admission are also associated with maternal oligohydramnios.<sup>5,6</sup> The present study has been done with an objective to study maternal and perinatal outcome associated with oligohydramnios in a tertiary care hospital.

**MATERIAL AND METHODS**

Present study was a hospital-based, observational study conducted in Department of Obstetrics and Gynaecology, Government Medical College & General Hospital, Ongole. Present study duration was of 1 year (January 2020 to December 2020). Study was approved by Institutional Ethical Committee.

**Inclusion Criteria**

Pregnant woman with confirmed gestational age  $\geq 37$  weeks, intact membranes, singleton gestations, AFI  $< 5$  cms and/or single vertical pocket is  $< 2$  centimetres, willing to participate.

**Exclusion Criteria**

1. Women with  $< 37$  completed weeks of gestation.
2. Ruptured membranes.
3. Malpresentations.
4. Associated medical complications like HDP, GDM, chronic hypertension etc., multiple gestation, fetal congenital anomalies, intrauterine fetal death.
5. Pregnant women with post-dated pregnancy (gestational age  $> 42$  weeks)

Study was explained and a written informed consent was taken from participants. Pregnant women underwent history taking, clinical examination (general, obstetric) followed by obstetric ultrasound examination for assessment of amniotic fluid volume using Amniotic fluid index (AFI). Largest vertical pocket in each quadrant was measured sonographically and the sum of the four measurements (cm) was computed as the AFI. Oligohydramnios was defined when the maximum vertical pocket of liquor was less than 2 cm or when amniotic fluid index (AFI) was less than 5 cm. Routine investigations like CBC, blood grouping and Rh typing, urine routine and microscopy, TFT, VDRL, viral markers were done. Ultrasound doppler study was done whenever required. Patients were admitted and advised adequate rest, left lateral position, oral and intravenous hydration. Decision regarding induction of labour or for spontaneous onset of labour was taken by senior obstetrician (unit in charge). Labour progress, mode of delivery, any complications, maternal and early neonatal outcome were noted and follow-up was kept till 7 days postpartum. Study Outcomes were mode of delivery, APGAR score at 1,5 min, birth weight, NICU admission, need for ventilatory support and perinatal death. Data was collected in Microsoft excel sheet and statistical analysis was done using descriptive statistics.

**RESULTS**

Total 110 patients were included in present study. Most common age group in our study was of 21- 25 years (40 %), followed by 26-30 years age group (20.91%). Mean maternal age in present study was  $24.88 \pm 6.11$  years. 60% patients in our study were nullipara, 23.64% were primipara. 39-40 weeks gestational age (35.45%) was most common group in present study. In our study we noted that oligohydramnios in term patients was associated with other antenatal complications such as prolonged pregnancy (40-42 wks.) (27.27%), gestational hypertension (14.55%), preeclampsia (10%), breech (8.18%) and anaemia (6.36%). 53.64% patients had none complications/high risk factors.

Most patients had AFI 4-5 cm (59.09 %), while AFI 2-3 cm was noted in patients 26.36 % and 14.55 % patients had AFI 0-2 cm. The mean amniotic fluid index in our study was  $3.38 \pm 1.24$  cm.

**Table 1: General characteristic**

Characteristic	No. of patients	Percentage
Age (Years)		
$\leq 20$	21	19.09
21-25	44	40
26-30	23	20.91
31-35	16	14.55
$\geq 36$	6	5.45

Parity		
0	66	60
1	26	23.64
2	11	10
3 or more	7	6.36
Gestational age		
37-38 weeks	18	16.36
38-39 weeks	23	20.91
39-40 weeks	39	35.45
40-42 weeks	30	27.27
Maternal Factors		0
None	59	53.64
Prolonged pregnancy (40-42 wks.)	30	27.27
Gestational Hypertension	16	14.55
Preeclampsia	11	10
Breech	9	8.18
Anaemia	7	6.36
AFI		0
0-2	16	14.55
2-3	29	26.36
4-5	65	59.09

In present study spontaneous onset of labour was noted in 50.91% patients, while induction of labour was required in 33.64% and 15.45% patients underwent elective LSCS. In present study mode of delivery was vaginal (64.55%), LSCS (30.91%) and Instrumental delivery (4.55%)

Table 2: Mode of delivery

Onset of labour	Vaginal delivery (%)	LSCS (%)	Instrumental delivery (%)	Total (%)
Spontaneous	47 (42.73%)	6 (5.45%)	3 (2.73%)	56 (50.91%)
Induced	24 (21.82%)	11 (10%)	2 (1.82%)	37 (33.64%)
Elective LSCS	0	17 (15.45%)	0	17 (15.45%)
<b>Total</b>	<b>71 (64.55%)</b>	<b>34 (30.91%)</b>	<b>5 (4.55%)</b>	<b>110</b>

Fetal distress (32.35 %) was most common indication for LSCS, followed by malpresentation (17.65 %), failed induction/non-progress of labour (NPL) (14.71 %) and unfavourable cervix (14.71 %).

Table 3: Indication of LSCS

Indication of LSCS	No. of patients (n=34)	Percentage
Fetal distress	11	32.35
Malpresentation	6	17.65
Failed induction/non-progress of labour (NPL)	5	14.71
Unfavourable Cervix	5	14.71
Previous section	3	8.82
Severe pre-eclampsia	2	5.88
Abruption	2	5.88

In present study 2.5-3.49 kg birthweight was most common (54.55%). 20 % babies required neonatal resuscitation. and 20.91 % babies needed NICU admission during study period. Majority of them were birthweight less than 2000 gm, meconium aspiration, cord looped around neck etc. We noted stillbirth in 1 case and early neonatal death in 3 babies. No maternal mortality was noted.

Table 4: Perinatal outcome

Outcome	No. of patients	Percentage
Birth weight		
1.5-2.49 kg	34	30.91
2.5-3.49 kg	60	54.55
3.5-4.49 kg	16	14.55
Meconium aspiration	13	11.82
APGAR ≤ 7 at 1 min	15	13.64
APGAR ≤ 7 at 5 min	5	4.55
Required neonatal resuscitation	22	20

Cord looped around neck	10	9.09
Admission to NICU	23	20.91
Stillbirth	1	0.91
early neonatal death	3	2.73

## DISCUSSION

Oligohydramnios causes compression of the cord between the fetus and the uterine wall may occur during contractions or fetal movement, this cord compression causes severe FHR decelerations which are associated with low APGAR scores and acidosis at birth, meconium staining, caesarean section and operative vaginal delivery for fetal distress. Oligohydramnios increases the risk of operative intervention and adverse perinatal outcomes. The common clinical features of oligohydramnios are smaller symphysio fundal height, fetal malpresentation, undue prominence of the fetal parts and reduced amount of amniotic fluid. Usually, the degree of Oligohydramnios is proportional to the severity of placental hypo perfusion and intra uterine growth restriction. The most likely cause of oligohydramnios in IUGR babies is decreased urine output.<sup>7</sup> In the present study most common age group was of 21- 25 years (40 %), followed by 26-30 years age group (20.91 %). Similar findings were noted by Guin G *et al.*<sup>8</sup> and Nazlima N. *et al.*<sup>9</sup> The mean maternal age in study by Amit S. *et al.*,<sup>10</sup> was  $26.07 \pm 3.84$  years and by Guin G *et al.*,<sup>9</sup> was  $24.71 \pm 4.58$  years. Similar findings were noted in the present study. In the study by Amit S. *et al.*,<sup>10</sup> 59.45 % women were nulliparous. Similar findings were noted in the present study. In the study by Amit S. *et al.*,<sup>10</sup> incidence of oligohydramnios was 3.39 %. Oligohydramnios was associated with antenatal complications like PIH (20.27%), IUGR (24.32%), prolonged pregnancy (10.81%), post term pregnancy (2.70%) and fetal anomalies (6.75%). The rate of LSCS in the oligohydramnios was 55.40%. Oligohydramnios was found to increase the incidence of low-birth-weight babies, low Apgar score at 1,5 min, admission to NICU and Perinatal mortality. In study by Bansal D,<sup>11</sup> incidence of oligohydramnios was 3% and 78.5% cases had associated obstetrical complications; acting singly or in combination for causing oligohydramnios. The LSCS was done in 47% in present study. 17.5% babies had low Apgar score (less than 7 at 5 min), 36% of neonates were admitted in NICU and perinatal mortality was 15%. Ashish P *et al.*,<sup>12</sup> studied 168 parturient women (84 study group and 84 control group) and noted that the rate of Caesarian section was significantly higher in oligohydramnios group compared to the control group (44.0% vs. 30.0% respectively). There was significant increasing in FHR decelerations, low Apgar score at 5 min, low birth weight, admission to NICU. Anisodowleh N<sup>13</sup> conducted a case control study of 255 pregnant women (85 cases of oligohydramnios and

170 cases in control group). Rate of caesarean was significantly higher in oligohydramnios group compared to the control group (75.3% vs. 36.5% respectively). There was statistically significant increasing in meconium passage in control group compared to oligohydramnios group (17.1% vs. 5.9% respectively). Mean of first minute and five-minute APGAR score, mean of birth weight, fetal sex and need to admission to NICU were not statistically different between two group of study. They concluded that amniotic fluid index of  $\leq 5$  cm detected after 37 completed weeks of gestation is not an indicator of poor perinatal outcome, but it is associated with increasing rate of caesarean delivery. In study by Sowmya K *et al.*,<sup>14</sup> low birth weight was seen in 48%, Apgar score  $<7$  seen in 14% and 14% were admitted in NICU. Another study by Madhavi K *et al.*,<sup>15</sup> found the incidence of meconium-stained liquor in 36%, 20% had Apgar score less than 7 at 5 minutes, incidence of NICU admission in 34%, incidence of meconium aspiration syndrome (MAS) in 6%. Similar findings were noted in the present study Early detection of oligohydramnios and its management may aid in decreased perinatal morbidity and mortality on one side and reduce caesarean deliveries on the other side. Due to intrapartum complication and high rate of perinatal morbidity and mortality, rates of caesarean section are rising, but decision between vaginal delivery and caesarean section should be well balanced so that unnecessary maternal morbidity prevented and other side timely intervention can reduce perinatal morbidity and mortality.

## CONCLUSION

In pregnant women with oligohydramnios, high incidence of meconium-stained liquor, fetal distress, need of LSCS, low Apgar score, low birth weight, perinatal morbidity and mortality noted. Evaluation of AFI should be used as an adjunct to other fetal surveillance methods to identify infants at risk of poor perinatal outcome.

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