



A STUDY OF FETAL OUTCOME IN PREGNANCIES WITH INADEQUACY OF LIQUOR AMNII AT TERTIARY CARE CENTER: A CROSS SECTIONAL STUDY

Neethika Raghuwanshi*¹ and Sumit Suresh Aggarwal²

¹*Associate Professor, Dept of Obstetrics & Gynecology, Govt Medical College, Akola.

²Assistant Professor, Dept of Community Medicine, Govt Medical College, Akola.

*Corresponding Author: Dr. Neethika Raghuwanshi

Associate Professor, Dept of Obstetrics & Gynecology, Govt Medical College, Akola.

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ABSTRACT

Background: Appropriate amount of amniotic fluid is essential for development of fetus. Any changes in normal course of fetus development can decrease or increase amniotic fluid, which will affect the outcome of pregnancy. So the present study was conducted with the aim of, to observe effect of oligohydramnios on fetal outcome. **Material and Methods:** in present study, 160 clinically suspected cases of oligohydramnios of more than 28 weeks of gestational age at Govt. Medical College Akola Maharashtra. All these cases were subjected to ultrasonography for fetal surveillance and AFI calculation. **Results:** The study revealed that predisposing factors and complications associated with oligohydramnios were – post term pregnancies, PROM, PIH, chronic abruption placenta. The incidence of C-section for fetal distress were higher in oligohydramnios. Genitourinary anomalies are most commonly associated with oligohydramnios but in our study incidence of central nervous system anomalies were more. 100% mortality noted in fetuses having renal anomalies. **Conclusion:** We concluded from this study that there was higher proportion of congenital anomalies associated with oligohydramnios hence it is essential to evaluate amniotic fluid volume during antepartum fetal surveillance, while maternal examination should look for high risk factors. Thus management of women with oligohydramnios should be individualised with careful monitoring during labour, judicious and active intervention timely gives margin of safety.

KEYWORDS: Oligohydramnios, Amniotic fluid index(AFI), Congenital anomaly.

INTRODUCTION

In the present era of ultrasonography, estimation of amniotic fluid volume (AFV) has replaced the subjective assessment of liquor amnii. Phelan and co-workers^[1] in 1987 defined Amniotic Fluid Index (AFI) as the method of summing the MVP from each quadrant formed by drawing two perpendicular lines passing through umbilicus over the enlarged uterus on abdomen. Phelan defined oligohydramnios as amniotic fluid index (AFI) ≤ 5 cm and borderline oligohydramnios as AFI between 5 and 8 cm between 36–42 weeks of gestation.^[1] Oligohydramnios occurs in about 1–5% of pregnancies at term.^[2] In pregnancies of more than 40 weeks of gestation, the incidence may be more than 12% as the amniotic fluid volume declines progressively after 41 weeks of gestation.^[3] Women with oligohydramnios are more likely to have abnormal or non-reactive FHR tracings, increased incidence of fetal distress, and thus an increased incidence of caesarean sections.^[4] Oligohydramnios is associated with a high rate of pregnancy complications and increased Perinatal morbidity and mortality. Thus, AFI-assessed antepartum or intrapartum would help to identify women who need increased antepartum surveillance for fetal outcome. So

the present study was carried out to see relation between oligohydramnios and fetal outcome.

MATERIAL AND METHODS

The present cross sectional observational study was conducted in the department of obstetrics and gynecology at Government Medical College, Akola, Maharashtra. The study duration was from 1st September, 2015 to 31th December, 2015 (total 4 months). Sampling method was universal sampling; all clinically suspected cases of oligohydramnios in third trimester were included in study. The study comprised of 60 clinically suspected cases of oligohydramnios in third trimester (>28 weeks of gestation) who presented in the Out Patient Department of obstetrics and gynecology. Patients' detailed history was taken on standard Paper questionnaire, clinical examinations was done and positive findings were noted, routine and specific investigations were performed. Each and every patients were goes through detailed ultrasonography. Each patient was scanned in recumbent position with linear probe 5.5 MHz transducer and assessment of amniotic fluid volume was done by four quadrant technique as described by **Phelan et al (1987)**^[1] known as amniotic

fluid index. To measure AFI the landmark of the maternal abdomen were used to divide the uterine cavity into four sections, the transverse line drawn from umbilicus divides the abdomen into upper and lower halves while linea-nigra divides it into right & left halves. The transducer head is placed on maternal

abdomen along the longitudinal axis and the MVP is measured, the number obtained from each quadrants was summed to calculate AFI. Depending upon the AFI levels the cases classified and managed. Informed verbal consent was taken from study subjects. Open source statistical software were used for statistical analysis.

RESULTS

Table 1: Distribution of patients by qualitative AFV by AFI

AFV	AFI in cm	No. of patients (%)
Very Low	<5 cm	040 (25)
Low	5-8 cm	100 (62.5)
Normal	8.1-25 cm	020 (12.5)

Out of 160 clinically suspected as oligohydramnios subjected to USG 140 (87.5%) confirmed on sonography. Out of 160 cases studied, 40 (25%) cases

were confirmed as very low AFI, 100 (62.5%) cases as low AFI, 20 (12.5%) cases had normal AFI.

Table 2: Distribution of patients according to parity

Parity	AFI (cm) < 5	5.1-8.0	8.1-25	Total (%)
P0	18	35	08	61 (38.1)
P1	12	25	08	45 (28.2)
P2	06	15	03	24 (15)
P3	04	20	01	25 (15.6)
P4	00	05	00	05 (3.1)
Total	40	100	20	160

Maximum number of patients were nulliparous 61 cases (38.1%) followed by primi 45 (28.2%). Out of 40 cases of very low AFI 18 were nulliparous.

Table 3: Maternal factor associated with oligohydramnios (n=160)

Maternal Factors		AFI < 5 cm	AFI 5.1-8cm	Total no (%)
Post maturity > 42 weeks		22	28	50 (35.7)
Prolonged pregnancy 40-42 weeks		08	10	18 (12.8)
PIH		04	34	38 (27)
a.	Gestational Hypertension	00	18	18
b.	Preeclampsia	03	12	15
c.	Eclampsia	01	04	05
PROM		06	24	30 (21.40)
Chronic abruption		00	3(1*)	03 (02.10)
Chronic renal failure		00	01	01 (0.71)
Unknown		00	10	10 (7.10)

(1*) – Represents one patient of chronic abruption could not be followed till delivery.

The table shows different maternal factors associated with oligohydramnios. Maximum incidence of

oligohydramnios was found in postmaturity 50 (35.7%) followed by PIH 38 (27%) and PROM 30 (21.40%).

Table 4: AFI and pregnancy outcome

pregnancy outcome	Very Low AFI (n=40)	Low AFI (n=100)	Normal AFI (n=20)
Forcep delivery	00	04	00
Caesarean section	16	08	04
Fetal Distress (LSCS)	10	06	02
Abnormal FHR	02	01	00
Apgar Score < 7			
- 1 min	04	02	00
- 5 min	02	00	00
Meconium staining	08	04	02

Breech presentation	04	02	02
Congenital malformations	06	03	00

The above table shows that in Very low AFI had poor outcome in every parameter measure in present study compare to low & normal AFI. higher incidence of LSCS, fetal distress, abnormal FHR, low Apgar score at

1 and 5 minutes, meconium staining and breech presentation in very low AFI as compared to low AFI and normal AFI.

Table 5: Distribution of fetal congenital anomalies and perinatal outcome in oligohydramnios

Name of congenital anomaly	AFI<8cm	Perinatal Outcome
Urinary tract system(02)		
b. Bilateral polycystic kidney with micro-optthalmiamicrognathia facial asymmetry	1	ENND
c. Posterior urethral valve with bilateral hydronephrosis and hydroureter	1	ENND
CNS(04)		
a. Hydrocephalus	2	Alive, FSB
e. Microcephaly	1	Alive
f. Meningomyelocele	1	FSB
GI abnormalities(02)		
a. Oesophageal atresia	1	FSB
c. Omphalocele	1	FSB
Skeletal malformations(02)		
a. Micrognathia with asymmetrical face	1	ENND
b. CTEV	1	Aliv

ENND= early neonatal death.

Table shows higher incidence of congenital anomalies in central nervous system (45%) followed by skeletal system (25%each) as compared to gastrointestinal and urinary system.

Out of 10 congenital anomalies four fresh Still Birth, three Early neonatal Death and three alive at discharge.

Table 6: distribution of IUGR patients according to AFI

Degree of oligohydramnios (AFI)	IUGR & Alive	IUGR & IUD	Total IUGR (%)
Very low (<5) n=40	10	04	14 (35)
Low (5.1 - 8) n=100	28	02	30 (30)
Normal (8-25) n=20	05	01	06 (30)
Total n= 160	43	07	50 (31.5)

The above table shows higher proportion of IUGR in very low AFI 35% as compared to the proportion in low AFI 30% and normal AFI 20%. From the above table it was derived that the incidence of stillbirth (IUD) among

IUGR fetuses increases as the AFI decreases 4,2 and 1 were the number of stillbirths with AFI < 5 cm, 5.1-8cm and 8.1- 25cm respectively.

Table 7: Analysis of perinatal mortality (overall including congenital deformities) related to AFI

Pregnancy outcome	AFI		
	0-5 cm (n=40)	5.1-8 cm (n=100)	8.1-25cm (n=20)
Stillbirth			
a. Fresh	05	02	00
b. Macerated	01	00	01
ENND	04	03	00
Total perinatal mortality	10	05	01
% according to respective class	25%	05%	5%

The table 7 shows highest rate of perinatal mortality in patient of severe oligohydramnios (25%) followed by low AFI (05%) and with minimum incidence in normal group (5%). It shows that as the severity of oligohydramnios increases perinatal mortality increases.

DISCUSSION

Perinatal mortality is significantly increased when oligohydramnios is present at delivery. Fatal conditions that are associated with oligohydramnios includes dysmaturity syndromes such as postmaturity, intrauterine

growth retardation and major fetal anomalies, most commonly involving the genitourinary tract. Accurate antepartum estimation of amniotic fluid volume by clinical means alone is exceedingly difficult but can be easily estimated by current diagnostic ultrasound methods (AFI).

In the present study the different maternal conditions were associated with oligohydramnios, in this Post-term pregnancy was an important etiological factor associated with oligohydramnios. In this study, out of 140 cases of oligohydramnios 50 patients (36%) were beyond 42 wks, out of which 22 had very low AFI (< 5 cm) and 38 had low AFI (5.1-8 cm). Among 140, 18 patients were between 40-42 wks gestation age out of which 8 had very low AFI and 10 were of low AFI. **Debra K Grub et al (1992)**^[5] has found high incidence (64%) of postdate pregnancies associated with oligohydramnios. Pregnancy induced hypertension were present in 27% cases of oligohydramnios in present study. **Golan et al (1994)**^[6] reported 22.1% incidence of PIH in 145 cases of oligohydramnios. Premature rupture of membrane is an important factor of association with oligohydramnios. In present study there were 30 patients (21.4%) of oligohydramnios associated with PROM, 6 patients had very low AFI while 24 patients had low AFI. **Wolf et.al. (1994)**^[7] had reported 16.5% incidence of PROM in their study. Chronic Abruptio was seen in 3 cases in third trimester associated with oligohydramnios, all were in low AFI group, one patient had normal delivery, one underwent caesarean section and one lost follow up, no perinatal mortality reported in this. **Shenker et al (1991)**^[8] had described 6 cases of oligohydramnios who had bleeding secondary to premature separation of the placenta between 10-23 weeks gestation, perinatal mortality rate in this series was 100%.

Perinatal mortality was increased further by preterm delivery even with normal fetuses. **Many A et al (1995)**^[9] reported that 20% of 275 women with an AFI of 25 cm delivered preterm and it was more common with anomalous fetus 40%. Negative Rh factor was observed in two cases (6.6%) but the fetuses were normal without any evidence of immune hydrops. Pregnancy induced hypertension was noted in eighteen cases, sixteen patients (53.3%) had gestational hypertension while two patients (6.6%) had preeclampsia.

Pregnancy outcome in oligohydramnios

Patient with very low AFI are known to have higher incidence of caesarean section i.e. in 16 cases (40%) as compared to patients with low AFI where caesarean section was done in 8 cases (8%). **Debra K Grub et al (1992)**^[5] found high incidence of caesarean section for fetal distress (55%), meconium staining (64%) and Apgar score < 7 at 1 min (55%) and 5 min, (9%) in the patients with AFI < 2 cm as compared to AFI > 5 cm.

Perinatal outcome in oligohydramnios

In the present study out of 140 cases of oligohydramnios, 10 (7.2%) cases were found of fetal congenital anomalies. **Golan et al (1994)**^[6] reported the overall rate of fetal malformations to be 11% and that of lethal malformations 4.8% in case of oligohydramnios. Genitourinary anomalies accounts for the majority of congenital anomalies associated with oligohydramnios. In the current study maximum congenital anomalies of central nervous system associated with oligohydramnios. Out of 10 anomalies four were related to central nervous system (hydrocephalus -2, microcephaly-1, meningomyelocele- 1), two were from skeletal system (micrognathia with asymmetrical face, CTEV), two were from urinary system (bilateral polycystic kidney, posterior urethral valve with bilateral hydronephrosis) and two were from gastrointestinal system (trachea-oesophageal fistula).

Out of two congenital renal anomalies, the one with bilateral polycystic kidneys with multiple anomalies resulted in ENND and one with posterior urethral valve had ENND due to pneumothorax on the first neonatal day. Thus we had 100% mortality in the renal anomalies associated with oligohydramnios. **R Rani et al (1995)**^[10] found 100% mortality in seven cases with bilateral renal dysplasia due to pulmonary hypoplasia; four were terminated, two were still birth and one was neonatal death, out of seven cases five had associated congenital anomalies.

Intrauterine growth retardation and oligohydramnios

Quantitative amniotic fluid volume is also related to higher incidence of IUGR. The overall proportion of IUGR in the study population was 31%. In patients with normal AFI the proportion of IUGR was 20%, in low AFI group the proportion was 30% and in very low AFI group the incidence was 35%. These results show that proportion of IUGR is highest in patients with very low AFI as compared to low AFI and normal AFI group. There was also high still births among IUGR fetuses in very low AFI (4 still births) as compared to low AFI group (2 still births) and normal AFI group (1 still birth). **Manning et al (1981)**^[11] found significantly higher incidence of IUGR in patients with oligohydramnios (89.6%) as compared to patients with normal qualitative AFV (6.6%). They also reported higher perinatal mortality in infants with IUGR in cases of oligohydramnios. **Phillipson et al (1983)**^[12] studied the association between oligohydramnios and IUGR. Their study determined that 40% of oligohydramnios complicated pregnancies resulted in small for gestational age infants while 8% of the infants from patient population with normal amniotic fluid volume were similarly affected. They recognized that the presence of oligohydramnios should increase the clinical suspicion of IUGR, but if it is used as the only screening tool, 84% of cases would be missed.

In the present study there was high perinatal mortality in

very low AFI (25%) as compared to normal AFI (5%). There was one perinatal death among 20 patients with normal AFI. There were 5 perinatal deaths in patients with low AFI, one fetal death was related to congenital anomalies, Four still births, all in normal fetuses, occurred in this group. Both gross and corrected perinatal mortality rate in this group were significantly greater than observed in normal AFI group. There were 10 perinatal deaths in patients with very low AFI. **Chamberlain et al (1984)^[13]** has found significantly greater gross (187.5/1000) and corrected (109.4/1000) perinatal mortality rate in decreased amniotic fluid volume as compared to gross (56.6/1000) and corrected (37.74/1000) perinatal mortality rate in marginal amniotic fluid volume and even lower gross (4.65/1000) and corrected (1.97/1000) perinatal mortality rate in the normal amniotic fluid volume.

Thomas R. Moore et al (1989)^[14] found higher incidence of perinatal mortality in severe oligohydramnios/anhydramnios group i.e. 81% as compared to mild/moderate oligohydramnios that is 11%. **Shenker et al (1991)^[8]** also found 52% of mortality rate in their study of 80 cases of severe oligohydramnios.

CONCLUSION

There was higher incidence of congenital anomalies associated with very low AFI. Thus it is essential to evaluate amniotic fluid volume during antepartum fetal surveillance. In presence of oligohydramnios thorough evaluation of the gravida for hypertension, pre-eclampsia, diabetes, chronic abruption, premature rupture of membrane, drug intake should be done. Thorough fetal anatomic survey focusing on the genitourinary system in oligohydramnios so that the patient may counseled for early termination before viability and unnecessary caesarean section can be avoided for IUGR, breech presentation and cord prolapse.

In very low AFI group, the risk of intervention for fetal distress, meconium passage and low apgar score at 1 and 5 min. was significantly higher as compared to low AFI and normal AFI. These findings suggests that patients with very low AFI should be monitored carefully during labour and active intervention for a very low AFI, probably allows margin of safety before a major risk of perinatal complications is incurred. Management of a woman with oligohydramnios must be individualized. One should strongly consider delivery if the fetus is likely to be mature. In case of gross immaturity pregnancies should be managed on maternal indications only.

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