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## A cross-sectional study of Pregnancy and its outcome with special reference to oligohydramnios and polyhydramnios at tertiary care center

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### ABSTRACT

**Background:** The importance of amniotic fluid volume as an indicator of fetal wellbeing has made its assessment an important part of antenatal fetal surveillance, also the level of amniotic fluid affect the fetal well being so the present study was conducted to study the pregnancy and its outcome with special reference to oligohydramnios and polyhydramnios. **Methodology:** We studied 200 clinically suspected cases of oligohydramnios and polyhydramnios of more than 28 weeks of gestational age at Govt. Medical College Akola Maharashtra. All these clinically suspected patients were further examined by ultrasonography for fetal surveillance, AFI calculation and confirmation of amniotic fluid level abnormality. **Result:** The study revealed that predisposing factors and complications associated with oligohydramnios were – post term pregnancies, PROM, PIH, chronic abruption placentae while for polyhydramnios they were preeclampsia, PROM, preterm labour, abruption placentae, malpresentation. There were no maternal high risk factors seen in oligohydramnios but polyhydramnios was observed with anemia, Rh factor incompatibility, PIH, gestational diabetes mellitus and multifetal gestation. The proportion of C-section for fetal distress was higher in oligohydramnios. **Conclusion:** We concluded from this study that there were many predisposing factors for both oligohydramnios and polyhydramnios they should be addressed judiciously to reduce their higher proportion. Hence it is essential to evaluate amniotic fluid volume during ante partum fetal surveillance, while maternal examination should look for high risk factors to avoid untoward complications beforehand. Thus management of women with oligohydramnios and polyhydramnios should be individualised with careful monitoring during labour, judicious and active intervention timely gives margin of safety.

**Key words:** Oligohydramnios, Pregnancy, Polyhydramnios

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### Introduction

Just as our ancestors crawled out of ocean to life on land, we too, until birth, float in amniotic fluid. It provides temperature stability, cushioning and a necessary presence in collapsed airways to help stimulate lung development. The importance of amniotic fluid volume as an indicator of fetal wellbeing has made its assessment an important part of antenatal fetal surveillance. Abnormalities such as meconium

staining, congenital anomalies, growth retardation, dysmaturity and fetal asphyxia have been associated with Oligohydramnios [1–3]. Polyhydramnios is sometimes associated with major fetal anomalies [2], aneuploidy, macrosomia and stillbirth [3]. 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 [4]. In the present era of ultrasonography estimation of amniotic fluid volume (AFV) has replaced the subjective assessment of liquor amnii. Manning *et al* (1980) [5] and Platt in 1980<sup>1</sup> defined normal amniotic fluid volume as maximum vertical pocket (MVP) of < 1 cm, but this definition was too restrictive. Manning redefined normal AFV as

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single MVP of 2 cm in two perpendicular planes. Study conducted by Manning *et al* (1995) [6] and Chamberlain *et al* (1984) [7] observed 7562 third

trimester pregnant women and summarized criteria for AFV.

Amniotic fluid volume (AFV)	Maximum vertical pocket in cm (MVP)
Increased	< 8 cm
Normal	2 – 8 cm
Marginal	1 – 2 cm
Decreased	< 1 cm

Phelan and co-workers in 1987 [4] 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.

Amniotic Fluid Volume (AFV)	Amniotic Fluid Index in cm (AFI)
Very Low	<5 cm
Low	5.1 – 8 cm
Normal	8.1 – 25 cm
High	>25 cm

So the level of amniotic fluid affect the fetal well being so the present study was conducted to study the pregnancy and its outcome with special reference to oligohydramnios and polyhydramnios

## Material and Methods

The present cross sectional observational study was carried out in the department of obstetrics and gynecology of Govt Medical College, Akola, Maharashtra. The study duration was the period of September 2014 to august 2015. Convenient sampling method was used. The study comprised of 160 clinically suspected cases of oligohydramnios in third trimester (> 28 wks of gestation) and 40 clinically suspected cases of polyhydramnios in third trimester who presented in the outpatient department of obstetrics and gynecology. These patient were further evaluated by detailed history, examinations and routine , specific investigations. All these clinically suspected patients were further examined by ultrasonography for fetal surveillance, AFI calculation and confirmation of amniotic fluid level abnormality. 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) [8]

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 in to 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 quadrant was summed to calculate AFI. Depending upon the AFI levels the cases classified and managed. All patients were informed about natured of study and consent were obtained from them. Study protocol was reviewed by ethical committee and granted permission for the study. Data was entered in duplicate into an Epidata Software Package (Epidata entry Version 3.1; Epidata Association, Odense, Denmark. <http://www.epidata.dk>), the database were compared ad discrepancies resolved by checking the original data. Data was analysed using SPSS 20.0 for windows (SPSS inc., Chicago, IL, USA).

## Result

In the present study, out of 200 cases, 160 clinically suspected as oligohydramnios subjected to USG 140 confirmed on ultrasonography. While 40 clinically suspected as polyhydramnios subjected to USG 30 confirmed.

**Table 1: Distribution of patients by qualitative AFV by AFI**

AFV	AFI in cm	No. of patients	Percentage
Very Low	<5 cm	40	20%
Low	5-8 cm	100	50%
Normal	8.1-25 cm	30	15%
Mild Increased	25-30 cm	10	5%
Moderately Increased	30-35 cm	16	8%
Severely Increased	>35cm	4	2%

Above table show that, out of 200 cases studied, 40 cases were confirmed as very low AFI, 100 cases as low AFI, 30 cases had normal AFI. 10 cases had mild polyhydramnios, 16 cases had moderate polyhydramnios & 4 cases had severe polyhydramnios.

**Table 2: Distribution of patients according to parity**

Parity	AFI ( cm)						Total (%)
	< 5	5.1-8.0	8.1-25	25.1-30	30.1-35	>35	
P0	18	35	12	04	07	02	78 (39)
P1	12	25	12	04	05	01	59 (29.5)
P2	06	15	04	02	03	01	31 (15.5)
P3	04	20	02	00	01	00	27 (3.5)
P4	00	05	00	00	00	00	05 (2.5)
<b>Total</b>	40 (20)	100 (50)	30 (15)	10 (05)	16 (08)	04 (02)	200 (100)

Table 2 shows that maximum numbers of patients were nulliparous 78 cases (39%). Out of 40 cases of very low AFI 18 (45%) were nulliparous. Among 4 polyhydramnios 2(50%) were nulliparous. Both condition oligohydramnios and Polyhydramnios were seemed more common in nulliparous.

**Table 3: Maternal factor associated with oligohydramnios**

Maternal Factors	AFI < 5 cm	AFI 5.1-8cm	Total No (%)
Post maturity > 42 weeks	22	18	50 (35.7)
Prolonged pregnancy 40-42 weeks	08	10	18 (12.8)
PIH	04	34	38 (27.0)
a) Gestational Hypertension	00	18	18 (12.8)
b) Preeclmpsia	03	12	15 (10.7)
c) Eclampsia	01	04	05 (03.50)
PROM	06	24	30 (21.4)
Chronic abruptio	00	3(1*)	03 (02.1)
Chronic renal failure	00	01	01 (00 .71)
Idiopathic	00	10	10 (07.10)

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

The table 3 shows different maternal factors associated with oligohydramnios. Maximum cases of oligohydramnios were most commonly observed in in postmaturity followed by PIH and PROM.

**Table 4: Maternal factors associated with polyhydramnios**

Maternal Factors	AFI(cm)			Total	
	25-30	30-35	>35	No	%
Preterm labour	01	02	04	07	23.3
PROM	00	01	03	04	13.3
Malpresentation	00	01	02	03	10.0
Pre eclampsia	00	02	00	02	6.6

The table 4 shows various maternal factor associated with polyhydramnios. Maximum cases of preterm labour (23.3%) was observed, followed by PROM (13.3%), Malpresentation (10%) and Preeclampsia(6.6%) observed.

**Table 5: Complicating factors associated with polyhydramnios**

Complications	No of patients	%
Anemia	22	73.3
Rh Factor	2	6.60
PIH	18	60
a. Gestational Hypertension	16	53.3
b. Preeclampsia	2	6.60
c. Eclampsia	-	-
Diabetes	1	3.30
Multiple gestation(Twins)	6	20.0

There was no complicating factor found in oligohydramnios where as polyhydramnios was found to be associated with maximum 73.3% is accounted by anemia followed by 53.3% by PIH.

**Table 6: AFI and pregnancy outcome**

Outcome	AFI(cm)						
	<5	5.1-8	8.1-25	25-30	30-35	>35	
Forcep delivery	00	04	00	00	00	00	4
Caesarean section	16	08	04	00	01	02	31
Caesarean section for FD	10	06	02	00	00	00	18
Abnormal FHR	02	01	00	00	00	00	3
Apgar Score< 7							08
- 1 min	04	02	00	00	00	02	02
- 5 min	02	00	00	00	00	00	
Meconium staining	08	04	02	00	00	00	14
Breech presentation	04	02	02	00	01	02	11
Cord prolapse	00	00	00	00	01	01	2
Preterm labour	00	00	00	01	02	04	07
Congenital malformations	06	03	00	02	05	04	20
Total	52	30	10	3	10	15	120

The table shows higher incidence of caesarean section for foetal 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. On

the other hand low rate of caesarean in cases of polyhydramnios and all were for malpresentation (breech/unstable lie).

## 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. While the conditions associated with polyhydramnios are preeclampsia, PROM, pre-term labour, abruption-placentae and malpresentation. 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). Postterm pregnancy is an important etiological factor associated with oligohydramnios. In present study we found that 50 oligohydramnios were beyond 42 wks, out of them 22 had very low AFI (< 5 cm) and 28 had low AFI (5.1-8 cm), 18 patients were found 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) [9] has found high incidence (64%) of postdate pregnancies associated with oligohydramnios. Marks *et al* (1992) [10] has reported oligohydramnios in 11.5% of 511 pregnancies at 41 weeks or greater. Pregnancy induced hypertension had an proportion of 27% in cases of oligohydramnios in our study. O'Brien JM *et al* (1993) [11] reported incidence of oligohydramnios ranging from 10-30% in hypertensive patients requiring hospitalization. Golan *et al* (1994) [12] 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) [13] 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, no perinatal mortality reported. Shenker *et al* (1991) [14] 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%. Wolf *et al* (1994) [13] found 10 cases (5.5%) of abruption placentae in 181 cases of oligohydramnios. While maternal factors found to be associated with polyhydramnios were Preeclampsia in 2(6.6%) cases of moderate polyhydramnios group and PROM was present in four cases out of which three

cases were of severe polyhydramnios while one case was of moderate polyhydramnios. Preterm labour was found to be associated with 7 cases (23.3%) of polyhydramnios out of which maximum cases were in severe polyhydramnios. Perinatal mortality was increased further by preterm delivery even with normal fetuses. Many *et al* (1995) [15] reported that 20% of 275 women with an AFI of 25 cm delivered preterm and it was more common with anomalous fetus 40%. Anemia was observed 22 patients of polyhydramnios (73.3%). Pregnancy induced hypertension was noted in 18 patients, 16 patients (53.3%) had gestational hypertension while 2 patients (6.6%) had preeclampsia. Diabetes leads to third trimester polyhydramnios due to osmotic diuresis caused by fetal hyperglycemia. In our study we had one case of diabetes associated with moderate polyhydramnios. Patient with very low AFI are known to have higher incidence of caesarean section ie in 16 cases(40%) as compared to patients with low AFI where caesarean section was done in 8 cases(8%). Debra K G *et al* (1992) [9] 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. In our study the proportion of preterm labour and malpresentation was high. Out of 3 patients of Breech presentation 2 patients belong to severe polyhydramnios and 1 patient were having moderate polyhydramnios. Out of 7 patients of preterm labour, 4 cases were having severe polyhydramnios, two were having moderate polyhydramnios and one was having mild polyhydramnios.

## Conclusion

There are many predisposing factors for oligohydramnios and polyhydramnios hence proper evaluation and follow up of these factors will help in picking up maximum cases of oligohydramnios and polyhydramnios. These cases are essential to be evaluated for amniotic fluid volume during antepartum fetal surveillance. Also in presence of oligohydramnios or polyhydramnios 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 and central nervous system in

polyhydramnios, 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 and polyhydramnios 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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