



To assess the perinatal outcome in isolated oligohydramnios (AFI<5cm) between 37 to 40 wks of gestation

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Abstract:

Oligohydramnios is defined as decrease in the amount of amniotic fluid in relation to the gestational age. This study was conducted in the department of obstetrics and gynecology, Government general hospital, Kurnool from March 2013-april 2014. This is a prospective case control study of the antenatal women who are admitted in labour room/ antenatal ward.

Key words: Amniotic fluid Index, Oligohydramnios, Meconium aspiration syndrome, Neonatal Intensive Care Unit

Introduction:

Oligohydramnios defined as decrease in the amount of amniotic fluid in relation to the gestational age. The AFI less than 5th percentile for the gestational age or AFI 5cms regardless of gestational age can be called as oligohydramnios [1]. It is one of the major causes for antenatal fetal surveillance and induction of labour. It poses a challenge in obstetric management. Incidence of oligohydramnios at term pregnancies is 1-5% [2]. **Isolated oligohydramnios** is an entity where amniotic fluid index is less than 5cm, but not associated with coexisting maternal and fetal complications.

Oligohydramnios is often accompanied by maternal conditions like preeclampsia, post term pregnancy, diabetic vasculopathy, preterm premature rupture of membranes and fetal conditions like IUGR, congenital abnormalities. Impaired placental function is one of the major causes of oligohydramnios [3]. It is associated with increased incidence of caesarean deliveries and NICU admissions (Conway, Jhang) [4].

Oligohydramnios in preterm pregnancies in the absence of intrauterine growth restriction, premature rupture of membranes, or fetal anomalies is associated with preterm deliveries but not with intrauterine death or birth asphyxia. In pregnancies complicated by severe preeclampsia

and remote from term, an amniotic fluid index of 5cm is a predictor of an adverse outcome [5].

The present study is conducted to evaluate the effect of isolated oligohydramnios on the mode of delivery.

Objectives

To assess the perinatal outcome in isolated oligohydramnios (AFI<5cm) between 37 to 40 wks of gestation.

Perinatal outcome of isolated oligohydramnios compared with that of normal full term pregnancy with AFI>5cms (without any maternal and fetal complications).

Patients and Methods

This study was conducted in the department of Obstetrics and Gynecology, Government General Hospital, Kurnool from March 2013-april 2014. This is a prospective case control study of the antenatal women who are admitted in labour room/ antenatal ward.

Inclusion Criteria: Any gravida, antenatal women who were sure of LMP with regular cycles, Singleton pregnancy with cephalic presentation, Gestational age between 37- 40wks.

Exclusion Criteria: Antenatal women not sure of dates, Multiple pregnancy, Previous caesarean section, Gestation age < 37wks and > 40wks,

Antenatal women with medical complicating disorders like gestational diabetes mellitus, hypertension, renal disease, PROM, With any placental abnormalities, Fetal conditions like congenital anomalies, IUGR Postmaturity

Amniotic Fluid Index Technique:

Estimates of amniotic fluid volume were recorded by means of AFI described by Phelan et al [6].

The step-by-step technique for determining the AFI is given below:

- Position of the patient is supine
- A linear, curvilinear or sector transducer probe 3.5 MHz can be used.
- Divide uterus into four quadrants using the maternal sagittal midline vertically, and an arbitrary transverse line approximately half-way between the symphysis pubis and upper edge of uterine fundus.
- The transducer must be kept parallel to the maternal sagittal plane and perpendicular to the maternal coronal plane throughout.
- The deepest, unobstructed and clear pockets of amniotic fluid without limb buds or cord structures is visualized, and the image frozen. The ultrasound callipers are manipulated to measure the pocket in a strictly vertical direction. The process is repeated in each of four quadrants and the pocket measurements summed = Amniotic Fluid Index [AFI]
- If the AFI is less than 8cm, perform the four quadrant evaluation 3times and average values. Normal AFI = 8-20cm. Oligohydramnios <5cm. Polyhydramnios >20cm. Borderline AFI = 5-8cm

Assessment of amniotic fluid volume

1. Clinical assessment

Measurement of symphysiofundal height and palpation of the pregnant uterus for overcrowded fetal parts. However, it is a poor predictor of amniotic fluid volume even by experienced personnel.

2. Quantitative assessment

It is amniocentesis with instillation of an inert chemical PAH (para amino hippurate), followed by dilution of the marker. It is the gold standard technique, however it is invasive and of little clinical significance.

3. Semiquantitative assessment:

Sonographic assessment is semi quantitative method. Ultrasound techniques currently used for evaluation of amniotic fluid include[7]

(a) Subjective assessment[2]: Amniotic fluid volume was simply evaluated visually and graded as decreased, normal or increased. The appearance of fetal crowding within the uterus

and an obvious lack of amniotic fluid were used to define oligohydramnios.

(b) Maximum vertical pocket: Manning and Platt (1980) [8] measured the single deepest pocket of amniotic fluid free of fetal extremities and umbilical cord to assess amniotic fluid volume. This definition was found to be restrictive, Manning redefined (1995) normal amniotic fluid as one pocket of amniotic fluid that measures at least 2cms in two perpendicular planes.

(c) Amniotic Fluid Index[6]: Phelan first described this method, which is an objective and reproducible method of estimating amniotic fluid. It estimates the amniotic fluid in four quadrants. The uterus is arbitrarily divided into four quadrants by the umbilicus transversely and linea nigra vertically. The largest vertical pocket free of fetal parts and loops of cord in each quadrant is measured and added to give AFI. To minimize errors when evaluating suspected oligohydramnios, three AFI measurements should be performed and averaged.

AFI has low specificity and positive predictive values for oligohydramnios and there is scant evidence that isolated oligohydramnios causes adverse fetal outcome. An AFI of less than 5cms requires prompt additional antenatal testing rather than immediate induction in low risk, term pregnancies.

Table 1: Diagnostic Categories of the Amniotic Fluid Index

Nomenclature	AFI
Oligohydramnios	5cms
Borderline	5.1-8cms
Normal	8.1-18cms
Polyhydramnios	More than 20cms

Results

The present study was conducted in department of Obstetrics and Gynecology, Government General Hospital cum Medical College, Kurnool; from March 2013 to April 2014.

Table 2: Age Distribution

AFI (cm)	AFI < 5(n=50)		AFI > 5(n=50)	
	n	%	n	%
18-20	5	10%	7	14%
21-30	45	90%	39	78%
31	0	0	4	8

Mean age in study group $23.7 \pm 2.3SD$ in Oligohydramnios and in the control group $23.8 \pm 3.7SD$.

Table 3: Gravidity Distribution

AFI (cm)	AFI < 5(n=50)		AFI > 5(n=50)	
	n	%	n	%
Gravida				
Primi	43	86%	42	84%
Second	2	4%	6	12%
Three or more	5	10%	2	4%

Chi Square=3.297, Degrees of Freedom= 2, p-value= 0.1923

Table 4: Induced Versus Spontaneous

AFI (cm)	AFI < 5(n=50)		AFI > 5(n=50)	
	n	%	n	%
Type of Labour				
Induced Labour	29	58%	14	28%
Spontaneous Labour	21	42%	36	72%

Chi Square= 9.18 Degrees of Freedom= 1 p-value= 0.002447

In this study, 29 (58%) women in study group had induced labour and 21 (42%) had spontaneous labour. In control group, 14 (28%) women had induced labour and 36 (72%) has spontaneous labour. Induction of labour was significantly raised in the study group ($p=0.002447$).

In study group, all the women with non reactive NST (10% of the total study group) had their labour induced with cerviprime gel while in control group, 4% of the women were induced with cerviprime gel.

Table 5: Mode of Delivery

AFI (cm)	AFI < 5(n=50)		AFI > 5(n=50)	
	N	%	n	%
Mode of Delivery				
Normal Labour (n=59)	25	50%	34	68%
LSCS (n=34)	23	46%	11	22%
FORCEPS (n=7)	2	4%	5	10%

Chi Square= 5.846 Degrees of Freedom= 2

p-value= 0.05376

In this study, caesarean was done in 34 women of whom, 23 were from study group (46%) and 11 were from control group (22%). Forceps delivery was carried out in 2 (4%) women of study group and 5 (10%) women of control group. Normal deliveries were high in both the groups, with study vs. control being 25 (50%) vs. 34 (68%). (p value is 0.05376), with caesarean section delivery rate being significantly high in isolated oligohydramnios group than in normal AFI group [46% vs. 22%].

Table 6: APGAR score - isolated oligohydramnios vs. normal AFI

AFI (cm)	AFI < 5(n=50)		AFI > 5(n=50)	
	n	%	n	%
APGAR Score <7				
1 MINUTE	9	18%	9	18%
5 MINUTE	9	18%	9	18%

In this study, the mean APGAR in study group at 1minute was $6.7 \pm 1.1SD$ vs. 6.9 ± 0.9 in control group. Mean APGAR in study group at 5 minutes was $7.9 \pm 0.89SD$ vs. $8 \pm 0.83SD$ in control group. Number of cases with APGAR score <7 at 1 minute and 5 minutes in both study and control groups are equal.

Discussion

The present study was conducted in department of Obstetrics and Gynecology, Government General Hospital cum Medical College, Kurnool, from March 2013 to April 2014.

The volume of amniotic fluid normally decreases at the end of gestation. Oligohydramnios has classically been associated with increased fetal morbidity and mortality in high risk pregnancies and post date pregnancies. However, isolated oligohydramnios appears to be poor predictor of adverse perinatal outcome [9].

In the following discussion, study group refers to women with isolated oligohydramnios (AFI<5cms) and control group refers to women with normal AFI (AFI>5cms).

Table 7:

Author / Name of the study	Mean Age (Yrs) Study group vs control
Conway et al [4]	24.4 ± 0.4 vs 23.0 ± 0.4
Eran Ashwal et al[10]	30 ± 4.9 vs 30.3 ± 5.0
Jun Zhang James et al [12]	28.5 vs 27.9
Hina Ahna, Shama et al	27.4 ± 4.9 vs 28.23 ± 4.8 (p=0.238)
Haifa A. Alchalabi et al	20-29
S.Manzanares, M.P.Carrillo et al [11]	29.2 ± 5.4 vs 29.1 ± 5.2
Brian M. Casey et al [13]	23.9 ± 5.9 vs 24.6 ± 6.1 (p=0.50)
Our Study	23 ± 2.3 vs 23.8 ± 3.7

Conway et al, Haifa A. Alchalabi et al, Brian M. Casey et al studies showed mean ages of study group and control group were 24.4 ± 0.4 vs 23.30 ± 0.4, which is consistent with our study. Statistically, it is not significant in all the above studies whereas the mean age is high in Eran Ashwal et al and Jun Zhang James et al and S. Manzanares et al.

Table 8:

Author / Name of the study	Primi Gravida Study group vs. control group	Multi Gravida Study group vs. control group
Conway et al [9]	47.5% vs 47.9%	52.5% vs. 52.1%
Eran Ashwal et al[10]	44.8% vs 30.7% P=<0.01	55.2% vs. 69.3%
Jun Zhang James et al [12]	53% vs 45%	47% vs. 55%
Hina Ahna, Shama et al	50.7% vs 63%	49.3% vs 36.9%
Haifa A. Alchalabi et al	54.5% vs 35.9%	45.5% vs 64.1%
S.Manzanares, M.P.Carrillo et al [11]	34.9% vs 32.5%	66.1% vs. 67.5%
Brian M. Casey et al [13]	40% vs 37%	60% vs. 53%
Our Study	86% vs 84%	14% vs. 16%

The number of primi gravidae with isolated oligohydramnios and normal group were included almost equivalently in Conway et al, Hina Ahna, Shama et al, S. Manzanares and Brian M. Casey et al, which are statistically not significant. Similar results were seen in our study. Our study has less number of multi gravidae in both groups when compared to the above studies.

Table 9:

Author / Name of the study	Mean Gestational Age (yrs) Study group vs. control group
Conway et al [4]	40.8 ± 0.1 vs 40.2 ± 0.1
Eran Ashwal et al[10]	39.8 ± 1.1 vs 39.3 ± 1.1
Jun Zhang James et al[12]	39.6 ± 1.7 vs 39.8 ± 1.7
Hina Ahna, Shama et al	37.8 ± 1.3 vs 38.9 ± 1.3
Haifa A. Alchalabi et al	37-40wk
Brian M. Casey [13]	38.0 ± 2 vs 39.1 ± 2
Elsandabese et al [15]	38-40 wk vs 38-41 wk
Our Study	38.4 ± 0.6 vs 38.5 ± 0.6

This study included antenatal women with gestational age of 37-40 weeks in both study and control groups. Our mean gestational age in study group vs. control group is 38.4 ± 0.6 vs. 38.5 ± 0.6 . Eran et al and Jun Zhang et al studies showed mean gestational age is nearly equal to mean value of our study. Conway et al studied women with gestational age between 37-41 weeks 6d, and hence the mean gestational age of his study is 40.8 ± 0.1 vs. 40.2 ± 0.1 wks. Hina et al and Brian M. Casey et al studies depict mean gestational age values to be more in control group than study group. Elsandabesee et al compared oligohydramnios in 38-40wks with 38-41wks and hence his results are not consistent with our study.

Table 10:

Author / Name of the study	Mean AFI / Range Study group vs. Control group
Conway et al [4]	3.1% vs 7%
Elsandabesee et al [15]	5.4% vs 7.5
Our Study	3.8 ± 0.9 vs 9.4 ± 1.1

In our study, the mean AFI in isolated oligohydramnios is 3.8 vs. 9.4 which is similar to Conway et al study. But Elsandabesee et al's retrospective study has mean AFI in oligohydramnios of 5.4cms which is contradicting our study. In this study, both isolated oligohydramnios (AFI<5cms) and borderline oligohydramnios (AFI 5-10cms) cases were considered and hence proper randomization of isolated oligohydramnios was not done.

Table 11:

Author / Name of the study	Induction of labour Study group vs. Control group
Conway et al [4]	15.8% vs 6.6%
Eran ashwal et al [10]	27.7% vs 3.7% (p= <0.001)
Hina Ahna, Shama et al	63.4% vs 14.1%
Brian M. Casey et al [13]	42.1% vs 22% (p= <0.001)
Elsandabesee et al [15]	45% vs 25%
Our Study	58% vs 28% (p=0.002)

Induction of labour was increased in isolated oligohydramnios groups in studies of Conway et al; Eran Ashwal et al; Hina et al; Elsandabesee et al which is concurrent with our study's result. The study of Brian M. Casey et al included pre-eclampsia patients and also patients with congenital anomalies in fetuses. These conditions resulted in higher incidence of induction of labour. In our study, there is a significant (twofold) rise in induction rate in isolated oligohydramnios group [13].

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References:

- Moore KL. 'The developing human' 4th edition Philadelphia WB Saunder publications, 1998:246-47.
- Williams K.'Amnioticfluid assessment'' Obstet Gynecol surv.1993dec; 48(12):795-800
- Placental development. In F Gary Cunningham, Kenneth J Leveno, Steven I Bloom, John Chavth, Larny C, Gilstrap III, Katharine d Wenstrom editions. William obstetrics, 22nd edition Newyork : MC Graw hill publication 2005. Chapter 3 p 66-68.
- Conway DL, Growths, Adkin WB, Langer.O. Management of isolated oligohydramnios in the teen pregnancy: A randomized clinical trial (Abstract). Amj Obstet Gynecol 2000; 182:s21.
- Junzhang J,Troendle J,Meikle S,Klebanoff MA,Ray burn W(2004)isolated oligohydramnios is not associated with adverse perinatal outcomes. Bjoc III: 220-225
- Phelan JP, Abn MO, Smith CV. Et al,''' Amnioticfluid index measurements during pregnancy'''.JReprod med,1987;601-604
- Thomas K.Moore. et al,'''Clinical assessment of amniotic fluid'''. J Clinics Obstet Gynecol,40 (2):303-313pp.
- Chamberlain PF, Manning FA, et al. "Ultra sound evaluation of amniotic fluid volume''.The relation between amniotic fluid volume to

- perinatal outcome. *Am j obstet Gynecol* 1984a: 150:245-49.
9. Conway DI, Adkins WB, Schroeder B, Langer O. Isolated oligohydramnios in the term pregnancy: Is it a clinical entity. *J Maternal fetal med* 1998;7:197-200.
10. Eran ashwal, Liran Hirsch, Nirmelamed. The association between isolated oligohydramnios at term and pregnancy outcome. *Arch Gynecol obstet* 2007 and 2012.00110.1007/s00404-014-3292-7.
11. Manzanares S, Carrillomp, Gonzalen-Peran E, Puertas A, Montoya IS (2007) isolated oligohydramnios in term pregnancy as an indication for induction of labours. *J Matern fetal neonatal med* 20(3): 221-224.
12. Junzhang J, Troendle J, Meikle S, Klebanoff MA, Ray Burn W (2004) Isolated oligohydramnios is not associated with adverse perinatal outcomes. *Bjoc III*: 220-225.
13. Casey BM, McIntire DD, Bloom SL, Lucas mj, Santos R, Twickler DM, Remus Rm. "Pregnancy outcomes after antepartum diagnosis of oligohydramnios at (or) beyond 34wks of gestation". *AM J Obstet Gynecol* 2000;909-920.
14. Rossi Ac, Prefumo F (2013). Perinatal outcomes of isolated oligohydramnios at term and post term pregnancy: A systematic review of literature with meta – analysis. *Eur J obstet Gynecol reprod boil*; 169(2):149-154.
15. Elsandabeese, Majumdars, Sinhas. (2007) obstetricians attitudes towards isolated oligohydramnios at term. *J Obstet Gynecol* (6):574-76.