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Maternal and fetal factors in pregnancy with oligohydramnios and maternal and perinatal outcome

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Abstract

Background: For maternal and fetal health, oligohydramnios has become a threatening condition. Oligohydramnios is the clinical condition in which amniotic fluid index (AFI) ≤ 5 cm is quantified using ultrasonographic techniques.

Aims and objectives: To evaluate amniotic fluid volume using AFI and to assess the maternal and fetal factors and perinatal outcome in cases with oligohydramnios.

Materials and Methods: Present study was performed at KRH and GR Medical College, Gwalior between September 2011 to September 2012. The study included 100 clinically suspected cases of oligohydramnios in third trimester. Detailed history along with ultrasonographic examination was performed for number of fetus, gestational age and placental localization. Amniotic fluid volume was measured using amniotic fluid index (AFI) as normal (8.1 to 18 cm), low (5.1-8 cm) and very low (≤ 5cm). Congenital anomalies of head spine abdomen and limbs were also observed. Apgar score at 1 min and 5 min, weight, sex, maturity, congenital anomalies, perinatal mortality if present was also noted.

Results: Out of 5789 admission, 100 (1.7%) were the suspected cases of oligohydramnios. Out of 100 suspected cases, 74 were confirmed using ultrasonography. Incidence rate of oligohydramnios as calculated out of total admissions (N=5789) and conformed cases during the study period was 1.2%. Out of 100 oligohydramnios cases, 38% were confirmed as having very low AFI, 36% had low and 26% cases had normal AFI. Most of the women who had very low AFI belong to age group of 21-25 years (57.89%) and were nulliparous (63.15%). Most common maternal factors associated with oligohydramnios were anemia and PIH. In women with very low AFI, vaginal delivery was possible in 36.8% compared to CS (50%). Variable fetal heart rate deceleration (10.52%) was mostly observed. Higher incidence of low Apgar score <7 at 1 min and 5 min and meconium stained liquor was observed among cases with very low AFI [6 (15.2%) and 5 (13.15%) respectively] and low AFI (22.2%) respectively. Higher incidence of IUGR was observed in very low AFI [16 (42.10%)]. Gross and corrected perinatal mortality rate was increased as the AFI decreased. Corrected still birth rate was increased as the AFI decreased in present study.

Conclusion: In very low AFI group, risk of intervention for fetal distress, meconium passage and low Apgar score at 1 and 5 min was significantly higher. Such patients should be monitored carefully during labor and active intervention for a very low AFI, probably allows margin of safety before a major risk of perinatal complication is incurred.

Keywords: amniotic fluid index, parinatal mortality, oligohydramnios, apgar score

Introduction

Estimation of amniotic fluid volume has become routine during obstetric scan. Amniotic fluid index (AFI) which is the semi quantitative measurement of amount of amniotic fluid is calculated by adding the depth in centimeters of the largest vertical pocket in each four quadrants [1].

Reported prevalence of oligohydramnios is about 1-5% in term pregnancies. Phelan *et al* in 1987 first defined an arbitrary cutoff value of oligohydramnios as AFI less than or equal to 5 cm [2].

Previous reports have proved the association of oligohydramnios with adverse perinatal outcome [3, 4] Oligohydramnios with IUGR, anomalies or hypertension can results in too much worse perinatal outcome compared to normal amniotic fluid volume with the same conditions [5].

Present study was performed with the aim of evaluating amniotic fluid volume as determined by AFI and to assess the maternal and fetal factors and evaluate perinatal outcome in cases with oligohydramnios.

Materials and methods

Present study was done at Department of Obstetrics and Gynecology, KRH and GR Medical college, Gwalior which comprised of 100 clinically suspected cases of oligohydramnios in third trimester (>28 weeks of gestation) from September 2011 to September 2012.

Institutional ethics committee approval and a written informed consent from each patients was obtained from each patients was obtained.

Thorough history including basic personal details, menstrual history, obstetrics history, past history of hypertension, pre-eclampsia, eclampsia, congenital malformation and drug intake was recorded for all the patients.

Ultrasonographic examination was performed for number of fetus, gestational age and placental localization. Amniotic fluid volume was measured using amniotic fluid index (AFI) as normal (8.1 to 18 cm), low (5.1-8 cm) and very low (≤ 5cm). Congenital anomalies of head spine abdomen and limbs were also observed.

Term patients with very low AFI and low AFI were monitored carefully during labour for fetal heart rate, meconium staining and mode of delivery. Apgar score at 1 min and 5 min, weight, sex, matuarity, congenital anomalies, perinatal mortality if present were noted and neonates was followed till seventh postnatal day.

All the analysis was done with IMB SPSS ver. 20 software. Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on mean ± standard deviation (SD). Unpaired t test and analysis of variance (ANOVA) with post-hoc Bonferroni and Tukey test was used to find out the significance between two and more than two groups respectively. Pearson correlation test was used to find correlation between study parameters. Significance is assessed at 5% level.

Results

Out of total 5789 admissions during the study period clinically suspected cases of oligohydramnios were 100 (1.7%). Out of 100 clinically suspected cases of oligohydramnios 74 (1.2% incidence rate out of total admission) were confirmed using USG. Out of 100 cases, the patients who had 3 or more visit were taken as booked (55%) cases and rest as emergency cases (45%) (Ratio of booked: emergency cases were 1.2:1).

Out of 100 oligohydramnios cases, 38% were confirmed as having very low AFI, 36% had low and 26% cases had normal AFI.

Table 1: Comparing different patients parameters with Amniotic Fluid Index

Parameters		AFI (cm)			Total*
		<5 (n=38)	5.1-8 (n=36)	8.1-18 (n=26)	
Age (years)	15-20 (n=7)	2 (28.57)	3 (42.86)	2 (7.69)	7
	21-25 (n=57)	22 (57.89)	17 (47.22)	18 (69.2)	57
	26-30 (n=31)	12 (31.57)	13 (36.11)	6 (25.07)	31
	>30 (n=5)	2 (5.26)	3 (8.3)	0 (0)	5
Parity	P0 (n=58)	24 (63.15)	22 (61.1)	12 (46.1)	58
	P1 (n=31)	8 (25.80)	10 (32.25))	13 (41.93)	31
	P2 (n=8)	5 (13.15)	2 (5.55)	1 (3.84)	8
	P3 (n=2)	1 (2.6)	1 (2.77)	0 (0)	2
	P4 (n=1)	0 (0)	1 (2.77)	0 (0)	1
SES	<200 (n=8)	2 (5.26)	2 (5.6)	4 (15.38)	8
	201-500 (n=20)	7(18.4)	6 (16.6)	7 (26.9)	20
	501-1000 (n=46)	16 (42.1)	18 (50)	12 (46.1)	46
	>1000 (n=26)	13 (34.2)	10 (33.3)	3 (11.5)	26

Data is expressed as no of patients (%) until and otherwise specifically mentioned, *data is expressed as percentage, SES; socioeconomic status (per capita income in rupees/month), AFI; amniotic fluid index

Table 2: Maternal factors associated with oligohydramnios

Parameters		AFI (cm)		Total	Percentage
		<5	5.1-8		
Postdated pregnancy (>42 weeks)		4	2	6	8.1
Prolonged pregnancy (40-42 weeks)		4	6	10	13.51
PIH	Mild	13	9	22	29.7
	Severe	5	1	6	8.1
PROM		6	4	14	13.54
Chronic abruption		1	0	1	1.35
Fetal congenital anomaly		3	0	3	4.05
Pregnancy with anaemia	Mild	15	16	31	41.8
	Moderate	8	8	16	21.6
	Severe	4	4	8	10.8
Unknown		9	16	25	33.7

Data is expressed as number, PIH; pregnancy induced hypertension, PROM; Premature rupture of membranes, AFI; amniotic fluid index

Table 3: Amniotic fluid index and pregnancy outcome

Outcome		AFI (cm)		
		0-5 (n=38)	5.1-8 (n=36)	8.1-18 (n=26)
Pregnancy outcome	Vaginal delivery	14 (36.8)	23 (63.8)	19 (73.07)
	Operative vaginal delivery (forceps delivery)	1 (2.7)	1 (2.7)	0 (0)
	CS related to oligohydramnios (total)	19 (50)	8 (21.1)	4 (15.3)
	▪ Elective CS (total)	7 (18.41)	0 (0)	-
	➢ Oligohydramnios with PIH	4 (10.92)	0 (0)	-
	➢ Oligohydramnioswith postdatism	1 (2.63)	0 (0)	-
	➢ Oligohydramnios with Prev. CS	1 (2.63)	0 (0)	-
	➢ Oligohydramnios with breech	1 (2.63)	0 (0)	-
	▪ Emergency CS for FD/TMSL	12 (31.6)	8 (21.1)	4 (15.3)

	CS For other indications (total) ➢ CPD ➢ NPOL ➢ Prev. CS with ST ➢ Breech with PROM	3 (7.89) 1 (2.63) 0 (0) 1 (2.63) 1 (2.63)	4 (11.1) 1 (2.8) 2 (5.5) 1 (2.8) 0 (0)	3 (11.5) 2 (7.69) 0 (0) 1 (3.8) 0 (0)
	Assisted breech delivery	1 (2.63)	0 (0)	0 (0)
Fetal heart rate pattern	Fetal bradycardia	2 (5.26)	2 (5.6)	1 (3.8)
	Variable fetal heart rate decelerations	4 (10.52)	3 (8.3)	0 (0)
	Late decelerations	1 (2.63)	0 (0)	1 (3.8)
	Fetal tachycardia	1 (2.63)	1 (2.8)	0 (0)

Data is expressed as no of patients (%), AFI; aminiotic fluid index, CS; caesarean section, CPD; cephalopelvic disproportion, NPOL; non progress of labor, PROM; Premature rupture of membranes

Higher incidence of low Apgar score <7 at 1 min and 5 min was observed among cases with very low AFI [6 (15.2%) and 5 (13.15%) respectively] and Low AFI [5 (13.8%) and 3 (8.3%) respectively] as compared to normal AFI [3 (11.5%) and 2 (7.69%) respectively].

Higher incidence of meconium stained liquor was observed among cases with very low AFI [8 (21%)] and low AFI [7 (22.2%)] as compared to normal AFI [3 (11.53%)]. Out of 74 cases of oligohydramnious there were 3 (4.05%) cases in which congenital anomalies of fetus were detected. The maximum number of congenital anomalies were found in very low AFI [3 (7.89%)] group. Out of 3 fetuses with congenital anomalies, 2 were fresh stillborn and one baby was macerated IUD.

Higher incidence of IUGR was observed in very low AFI [16 (42.10%)] as compared to incidence in low AFI [7 (19.94%)] and normal AFI [2 (7.69%)]. Perinatal mortality was maximum in very low AFI group [9 (23.7%)] as compared to low AFI [3 (8.33%)] and normal AFI [1 (3.84%)]. Out of 5 early deaths in very low AFI group, 3 (60%) were because of hypoxic ischemic encephalopathy, 1 (20%) was because of septicemia and 1 (20%) was because of aspiration syndrome.

In present study, gross and corrected perinatal mortality rate was increased as the AFI decreased. Gross perinatal mortality was 236.8/1000, 138.8/1000 and 38.46/1000 births in very low AFI, low AFI and normal AFI respectively. Corrected mortality rate was 157.8/1000, 138.8/1000 and 38.46/1000 births in very low AFI, low AFI and normal AFI respectively.

Corrected still birth rate was increased as the AFI decreased in present study. It was 26.3/1000 births in very low AFI births while there was stillbirth cases in low and normal AFI groups.

Discussion

Reports have shown an increase in perinatal morbidity and mortality when oligohydramnios is present in women. It is difficult to accurately estimate antepartum amniotic fluid volume clinically but using current ultrasound techniques it can easily be diagnosed [6, 7]

Mohamed performed a similar study in Egypt on 200 patients and revealed that rate of CS was significantly higher in oligohydramnios group compared to the normal group. He also reported increase in FHR decelerations, thick meconium, low Apgar score at 5 min and an increased rate of congenital anomalies and IUGR in patients with oligohydramnios [8] Similar to Mohamed, in present study 50% of the patients had CS deliveries, higher incidence of IUGR, congenital anomalies were more common in patients with very low AFI. Similar results were reported by another study performed in Vadodara by Patel *et al* which reported that in patients with isolated oligohydramnios; congenital anomalies, meconium stained amniotic fluid and CS deliveries were common [1]

Jagatia *et al* studied maternal and fetal outcome in 100 patients with oligohydramnios and reported higher incidence of oligohydramnios in primipara which is in accordance with the finding of present study [9] Most common cause of oligohydramnios reported by Jagatia *et al* was idiopathic followed by PIH but in present study most common cause was pregnancy with mild anemia followed by PIH and in 33.7% patients cause was unknown [9].

A study done by Bhat *et al* at Bharati Vidyapeeth Deemed University Medical College & Hospital at Sangli including 100 patients in third trimester of pregnancy with Oligohydramnios; found that the most common cause of oligohydramnios was idiopathic followed by PIH. Doppler study showed feto placental insufficiency in most of the patients [10].

Another study done by Moses *et al* with 150 cases of oligohydramnios in third trimester revealed that most of the patients were having moderate AFI (3.1-5 cm) followed by severe AFI (1-3 cm) or oligohydramnios which in accordance to present study data where most of the patients had AFI between 0-5 cm [11].

Higher incidence of low Apgar score <7 at 1 min and 5 min was observed among cases with very low AFI and Low AFI patients. Study done by Syria *et al*, have reported 38.8% incidence of Apgar score less than 7 at 1 minute. [12] Another study by Casey *et al* reported 6% babies had Apgar score of less than 3 at 5 minute [4].

In present study, gross and corrected perinatal mortality rate was increased as the AFI decreased. Moses *et al* also calculated perinatal mortality rate in patients with decreased qualitative amniotic fluid volume and found it to be 188/1000 but in present study gross perinatal mortality was 236.8/1000, 138.8/1000 and 38.46/1000 births in very low AFI, low AFI and normal AFI respectively [11] Perinatal mortality reported by Chhabra *et al* was very high (87.7%). [13] Deficiency of amniotic fluid results in compression of fetal abdomen which decreases the diaphragm movement.

Conclusion

Oligohydramnios is frequent in pregnant women with anemia and or PIH. This requires intensive fetal observation and proper antepartum and intrapartum care. Amniotic fluid volume measured AFI is a good predictor of fetal tolerance during labour. Decrease in amniotic fluid volume is associated with an increased risk of abnormal heart rate and meconium stained fluid. Rates of CS were high in patients with Oligohydramnios. In order to reduce perinatal morbidity and mortality, early monitoring of AFI must be performed.

Reference

1. Patel PK, Pitre DS, Gupta H. Pregnancy outcome in isolated oligohydramnios at term. Ntl J of Community Med. 2015; 6(2):84-88.
2. Phelan JP, Smith CV Broussard P, Small M. Amniotic fluid volume assessment with the four – quadrant technique at 36-42 week, gestation. J Reprod Med. 1987; 32:540-542
3. Chauhan SP, Sanderson M, Endrix NW, Magann EF, Devoe LD. Perinatal outcome and amniotic fluid index in the antepartum and intrapartum periods: a meta analysis. Am J Obset Gynecol. 1999; 181:1473-1478.
4. Casey BM, McIntire DD, Bloom SL, Lucas MJ, Santos R, Twickler DM *et al*. Pregnancy outcomes after antepartum diagnosis of oligohydramnios at or beyond 34 weeks' of gestation. Am J Obstet Gynecol. 2000; 182(4):909-12.
5. Philipson EH, Sokoj RJ, Williams T. Oligohydramnios: clinical association and predictive value for intrauterine growth retardation. Am J Obstet Gynecol. 1983; 146:271-8.
6. Rutherford SE, Phelan JP, Smith CV, Jacobs N. The four-quadrant assessment of amniotic fluid volume: an adjunct to antepartum fetal heart rate testing. Obstet Gynecol. 1987; 70(3):353-6.
7. Ali HS. Assessment of amniotic fluid index in normal pregnancy at a tertiary care hospital setting. Department of Obstetrics & Gynaecology, Ziauddin University, Karachi, Pakistan. J Ayub Med Coll Abbottabad. 2009; 21(3):149-50.
8. Mohamed AHG. Outcome among Patients with Oligohydramnios and Suggested Plan of Action. IOSR Journal of Nursing and Health Science (IOSR-JNHS). 2015; 4(5):65-75.
9. Jagatia K, Singh N, Patel S. Maternal and fetal outcome in oligohydramnios: A study of 100 cases. Int J Med Sci Public Health. 2013; 2:724-727.
10. Bhat S, Kulkarni V. Study of effect of oligohydramnios on maternal and fetal outcome. Int J Med and Dent Sci. 2015; 4(1):582-588.
11. Moses V, Thakre S. A study of maternal and fetal outcome in third trimester diagnoses case of oligohydramnios. Int J Reprod Contracept Obstet Gynecol. 2016; 5:2944-8.
12. Sriya R, Singhai S. Perinatal outcome in patients with amniotic fluid index < 5cm. J Obstet Gynaecol India. 2001; 51:98-100.
13. Chhabra S, Dargan R. Oligohydramnios - a potential marker for serious obstetric complications. J Obstet Gynecol. 2007; 27(7):680-3.