

Original research article

A Clinical Study of Feto-Maternal Outcome in Pregnancies with Abnormal Liquor Volume

Dr. Reshita¹, Dr. Archana Kumari²

¹ Senior Resident, Department of Obs & Gynae, PMCH, Patna

² Junior Resident, Department of Obs & Gynae, PMCH, Patna

Corresponding Author: Dr. Reshita

Abstract

Background: The amniotic fluid that surrounds the fetus serves several roles during pregnancy. Importance as indicator of fetal status is a relatively recent development and has become an integral part of fetal evaluation. Oligohydramnios is diagnosed when ultrasonographically the AFI is ≤ 5 cm/ 5th centile. It affects 3-5% of pregnancies.² Polyhydramnios is diagnosed when the amniotic fluid index is above 25cm/ 95th percentile.

Methods: Pregnant women with abnormal AFI reporting Patna medical college & Hospital, Patna. Study duration of Two years. were included in the clinical study of maternal and fetal outcome. All singleton, non anomalous, low risk pregnancies with AFI ≤ 5 cm and ≥ 25 cm with intact membranes and gestational age between 28-42 weeks were included in the study. The AFI was measured using Phelan's four quadrant technique. An AFI of ≤ 5 cm is normal.

Conclusion: The clinical study was conducted to know the fetomaternal outcome in pregnancies with abnormal liquor volume. The study showed that isolated oligohydramnios and isolated polyhydramnios have no adverse maternal and perinatal outcome.

Keywords: Abnormal liquor volume, isolated oligohydramnios, isolated polyhydramnios.

Introduction

The amniotic fluid that surrounds the fetus serves several roles during pregnancy. It creates physical space for musculoskeletal development, promotes normal fetal lung development and helps to avert compression of the umbilical cord.¹ Amniotic fluid volume is the sum of inflow and outflow of fluid into the amniotic space and as such reflects fetal fluid balance. Early on the gestation Amniotic Fluid is thought to be derived directly from the mother across amnion, fetal surface of placenta and fetal body surface. In later half main source is fetal urine, lung liquid secretion; major routes of resorption are fetal swallowing and intramembranous pathways. The amniotic fluid volume at each week of pregnancy is variable. It increases from 20ml at 10 weeks to 770ml at 28 weeks, remains at a steady state till 39 weeks, after which decreases dramatically. The average Amniotic fluid volume in third trimester is 700-800 ml.² Clinical assessment of amniotic fluid volume including bimanual palpation, symphysio fundal height is unreliable. Diagnosis is generally made by measuring the Amniotic fluid compartment using ultrasound. Definition of increased and decreased Amniotic fluid volume are based on

the sonographic criteria.² Oligohydramnios is diagnosed when ultrasonographically the AFI is $\leq 5\text{cm}/5^{\text{th}}$ centile, or a single deepest pocket of 2cm^1 . It affects 3-5% of pregnancies.² Oligohydramnios is associated with high risk adverse perinatal outcome like fetal distress, meconium staining, low apgar and neonatal resuscitation/ NICU admission but is a poor predictor. Oligohydramnios is often used as an indicator for delivery. Polyhydramnios is diagnosed when the deepest vertical pool of amniotic fluid is 8cm or greater, amniotic fluid index measured by Phelan's technique above $25\text{cm}/95^{\text{th}}$ percentile. Incidence is around 1% of all pregnancies. The etiology of polyhydramnios is diverse and involves many maternal and fetal conditions including diabetes mellitus, congenital anomalies, isoimmunisation, multiple gestation and placental abnormalities. Half of the cases are found to be idiopathic¹. A specific cause was identified in only 16% of the mild cases of polyhydramnios, 90% for moderate cases and 100% for severe cases³. Premature labour complicates 40% of polyhydramnios patients⁴.

Objectives

To study the obstetric outcome in pregnancies with oligohydramnios and polyhydramnios.

To determine the perinatal outcome in pregnancies with Oligohydramnios and polyhydramnios.

Review of Literature

Bachhav A.A et al⁵, studied 180 pregnant women at 37-40 weeks of gestation with no known obstetric and medical complications with $\text{AFI} \leq 5^{\text{th}}$ percentile. Mean AFI was 4.14 cm and NST was found to be non reactive in 65%. 66% were delivered by LSCS compared to 33% of the control group ($p < 0.001$). 86% of the patients were induced for oligohydramnios and among those 18% underwent LSCS. In the study group 24% underwent LSCS for fetal distress. 34% of babies had $\text{apgar} \leq 7$. 14% had respiratory distress compared to 6% in control group ($p < 0.001$). Maximum perinatal morbidity was seen in study group with AF 2-3 in the form of fetal distress and Low APGAR scores. Jun Zhang et al⁶ used data from the multicentre clinical trial of Routine Antenatal Diagnostic Imaging with Ultrasound (RADIUS), in which 15,151 low risk pregnant women were randomly assigned to the ultrasound screening group or the control group. Women in the screening group underwent sonographic exams at 15-22 and 31-35 weeks of gestation. Oligohydramnios (amniotic fluid index $\leq 5\text{ cm}$) was diagnosed in 1.5% (113/7617) of women with ultrasound screening compared with 0.8% (57/7534) among the controls. Approximately half of the oligohydramnios cases in the screening group were isolated with no clearly associated factors (e.g. premature rupture of the fetal membranes, congenital anomalies, diabetes, hypertension, postdate and intrauterine growth restriction). Fetal weight centiles in isolated oligohydramnios cases did not change significantly from diagnosis until delivery. Kahraman ulker et al⁷ studied 700 women with no maternal and fetal complications, 37-42 weeks with intact membranes in active labour. Severity of AFV decrease increased the chance of intrapartum abnormal findings. 9.4% had cesarean deliveries and out of which 33% was for fetal distress. Desai pankaj et al⁸ studied all singleton term non anomalous pregnancies with $\text{AFI} \leq 5\text{cm}$ with intact membranes excluding maternal complications, found no statistical difference in cesarean sections, instrumental deliveries, indication for LSCS, fetal heart abnormalities. There was no admission to NICU or any perinatal mortality. Umber A et al⁹ conducted a study in 500 women with singleton pregnancies, 40-42 weeks GA, no anomalies and no maternal complications and Amniotic Fluid Index (AFI) was evaluated within 4 days of delivery in these patients with technique of Phelan et al. 70% of patients showed values of AFI above 50 mm and 29% of patients showed $\text{AFI} \leq 50\text{ mm}$ (Oligohydramnios). As noted previously, hydramnios etiologies are varied, and treatment is directed in most situations to the underlying cause. Occasionally, severe hydramnios may result in early preterm labor or the development of maternal respiratory compromise. In such cases, large-volume

amniocentesis—termed amnioreduction— may be needed. The needle insertion technique is the same as for amniocentesis.

Material and methods

The present study was conducted in the department of obstetrics and gynecology, at Patna medical college and Hospital Patna, Bihar, Study duration of Two years. Data was collected using a pretested proforma meeting the objectives of the study by convenience sampling method. The patients who were diagnosed to have oligohydramnios (AFI<5cm) and polyhydramnios (AFI>25cm) of gestational age 28-42 weeks were included in the study. Selection of cases was based on detailed history like duration of amenorrhea, fetal movements, past obstetric history, medical history regarding hypertension, diabetes and renal disease were recorded.

On clinical examination presence of anemia, pedal edema, blood pressure were recorded. Routine examination of cardiovascular and respiratory system was made.

All the cases were subjected to routine blood investigations like blood grouping, Rh typing, HIV, HbsAg, VDRL, GTT, urine routine and microscopy.

Detailed ultrasound examination was done and AFI was measured using Phelan's fourquadrant ultrasound technique. The uterus is arbitrarily divided into four quadrants by the umbilicus transversely and the linea nigra vertically. The largest vertical pocket free of fetal parts and umbilical cord loops in each quadrant was measured and AFI was taken as a sum of the four quadrants, in cm. An AFI of 5-24cm is normal.

Inclusion criteria

Pregnant women with gestational age between 28 to 42 weeks with intact membranes. AFI≤ 5cm and AFI≥ 25cm as determined by ultrasonography.

Exclusion criteria

Premature rupture of membranes

Post term pregnancies

High Risk pregnancies- like diabetes, hypertension, renal disease, pre-eclampsia etc.

Results

Table 1: Distribution of cases into different age groups

Crosstab					
			GRP		Total
			Oligohydramnios	Polyhydramnios	
AGES	<20	Count	12	2	14
		% of GRP	9.2%	6.7%	8.8%
	20-24	Count	87	13	100
		% of GRP	66.9%	43.3%	62.5%
	25-29	Count	27	14	41
		% of GRP	20.8%	46.7%	25.6%
	30+	Count	4	1	5
		% of GRP	3.1%	3.3%	3.1%
Total		Count	130	30	160
		% of GRP	100.0%	100.0%	100.0%

age distribution of 160 women in between the ages of 19-33 years. They were divided into

4 groups, with maximum number of patients(66.9%) belonging to 20-24 years in the oligohydramnios group and 46.7% of women belonging to being 22.59 years. 25-29yrs age group in the polyhydramnios group. Mean age

Table 2: LEVEL OF EDUCATION

		GRP		Total
		Oligohydramnios	Polyhydramnios	
Primary	Count	38	6	44
	% of GRP	29.2%	20.0%	
Secondary	Count	70	15	85
	% of GRP	53.8%	50.0%	
+10	Count	22	9	31
	% of GRP	16.9%	30.0%	
Total Count		130	30	160
% of GRP		100.0%	100.0%	

The educational status of the patients in the two groups. Maximum number of patients in both the study groups had secondary education. The oligohydramnios group it was 53.8% of patients who had secondary education where as in the polyhydramnios group it was 50%. period of gestation at diagnosis in each group. Majority of women had gestational age between 37-40 weeks i.e. 54.6% in oligohydramnios and 60% in polyhydramnios. 39.2 % of the oligohydramnios group were beyond 40 weeks of gestation. 6.15% were preterm pregnancies. The gestational age ranged between 30 weeks till 41 weeks. 37.5% of the polyhydramnios group were beyond 40 weeks and 11.9% were < 37 weeks. The gestational age was between 33 weeks and 41 weeks, In the oligohydramnios group, 55.4% had vaginal delivery and 44.6% had cesarean section. In the cesarean group, 30.8% had Emergency LSCS, 13.8% had Elective LSCS. Out of the 72 women who had vaginal delivery, 93.3% had induced vaginal delivery with either PgE2 gel or syntocin or both. Out of the 98 women induced, 31 (26.5%) underwent emergency LSCS, commonest indication being failed induction (61%). In the polyhydramnios group, 50% had vaginal delivery and 50% underwent cesarean section, out of which, 26.7% had emergency LSCS and 23.3% had elective LSCS. In polyhydramnios among 15 women who had vaginal delivery, 10 (66.67%) had induced delivery. Out of the 14 women induced, 4 (28%) underwent emergency LSCS, commonest indication being fetal distress

Table 3: Birth weight

			GRP		Total
			Oligohydramnios	Polyhydramnios	
BIRTH WEIGHT	<2.5	Count	23	6	29
		% of GRP	17.7%	20.0%	18.1%
	2.5-3	Count	88	9	97
		% of GRP	67.7%	30.0%	60.6%
	3-3.5	Count	16	11	27
		% of GRP	12.3%	36.7%	16.9%
3.5+	Count	3	4	7	
	% of GRP	2.3%	13.3%	4.4%	
Total		Count	130	30	160
		% of GRP	100.0%	100.0%	100.0%

the birth weight in oligohydramnios and polyhydramnios group. 67.7% of the babies in the

oligohydramnios group weighed between 2.5 to 3 kg. Only 2.3% of them weighed more than 3.5 kg, Whereas in the polyhydramnios group, 36.7% weighed 2.5- 3 Kg, 30% weighed 3-3.5 and 13.3% weighed more than 3.5 kg.

Discussion

In this clinical study, 160 women with abnormal liquor volume, with gestational age 28-42 weeks were analyzed for maternal and perinatal outcome. After taking detailed history and complete examination, AFI was obtained sonographically by Phelan's method. Women with $AFI \leq 5$ and $AFI \geq 25$ cm without any other high risk factors i.e. isolated oligohydramnios and isolated polyhydramnios were followed up till delivery, pregnancy and perinatal outcomes were recorded.

Table 4: Maternal and perinatal outcome in oligohydramnios and polyhydramnios

Outcome	Oligohydramnios (n=130)	Polyhydramnios (n=30)
Induction of labour	75.3%	46.65
Vaginal delivery	55.4%	50%
LSCS		
Emergency	30.8%	26.7
Elective	13.8%	23.3%
Meconium stained liquor	18.5%	23.3%
Preterm delivery	12.3%	10%
Apgar <7 at 5 min	4.6%	6.7%
birth weight < 2.5 kg	17.75	20%
NICU admission	6.9%	3.3%
PNM	3.07%	3.3%

Maximum number of patients (66.9%) belonged to 20-24 years age group in the oligohydramnios group and Maximum number of patients (46.7%) belonged to 25-29 in the polyhydramnios group. Oligohydramnios was more common in primigravidas (66.2%) and polyhydramnios was more common in multigravida (63.3%). Bachhav et al, found that 66% of women with $AFI < 5$ underwent LSCS, 34% had vaginal delivery. Similar results were observed by Nazlima et al, where 71.79% underwent LSCS. In our study, more than half, 53% had normal vaginal delivery, 44.6% had LSCS, out of which 13.8% underwent elective LSCS. Similar results were observed by Desai et al, where 74.54% had normal vaginal delivery. In our study high rate of induction of labour was performed among women with isolated Oligohydramnios. This is similar to that reported by others¹¹ where 50% of low risk women with reduced amniotic fluid volume underwent induction of labour Conway et al¹² studied 183 women who underwent labour induction for oligohydramnios ($AFI < 5$ cm), and they were matched with 183 controls. The neonatal outcome measures did not differ between the two groups but like in our study, a significantly higher caesarean delivery rates were observed among women who were induced than among controls.

Meconium stained liquor was observed in 18.5% of women, lesser compared to Jindalet al (48%) and Nazlima et al¹³ (30.76%), similar to Kahraman et al (11.6%).

Table 5: Comparative study for perinatal outcome in oligohydramnios

	Nazlima et al	Umber et al	Present study
APGAR <7 at 5 min	26.9%	6%	4.6%
< 2.5kg	65.3%	36%	17.7%
>3.5kg	-	2.7%	2.3%
NICU admission	19.2%	7%	6.9%
PNM	2.4%	-	3.07%

Table 6: Comparative study for mode of delivery in polyhydramnios

	Kemp et al	Naser omar et al	Salihtaskin et al	Present study
Normal vaginal delivery	76.8%	75.6%	67.8%	46.6%
LSCS	23.2%	24.6%	32.2%	50 %
Forceps	-	-		3.3%

An APGAR score of < 7 was seen in 26.9% of babies in Nazlima et al, 12 % of babies by Jindal et al. in the present study only 4.6% of babies had APGAR less than 7 at 5 minutes similar to Umber et al (6%).

In the present study, 46.6% had normal vaginal delivery, 50% had LSCS and 3.3% had instrumental delivery. The high rate of LSCS was probably due to high rates of induction. Kemp et al, Omar et al and SalihTaskin et al¹⁴ had lesser rates of LSCS, majority delivered vaginally.

6.6 % of the babies weighed more than 4 kg, 20 % of the babies weighed less than 2.5 kg, 6.7% had APGAR less than 7 at 5 min. 3.3% of babies had NICU admission. The outcomes were comparable to studies by panting Kemp et al, Naser Omar et al, MalihaaSadaf et al¹⁵ who found no increases in adverse perinatal outcome.

Conclusion

The clinical study was conducted to know the fetomaternal outcome in pregnancies with abnormal liquor volume.

The study showed that isolated oligohydramnios and isolated polyhydramnios have no adverse maternal and perinatal outcome.

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