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Mode of delivery and perinatal outcome in oligohydramnios

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Abstract: *To assess the association of adverse perinatal outcome in cases with oligo hydramnios diagnosed antepartum. The results are compared with perinatal outcome of controls with Amniotic fluid index (AFI) 8-18 cms. The study population consisted of 100 antenatal women with gestational age 37 weeks attending the antenatal clinic & labour rooms of this hospital. The AFI was measured by 4 quadrant technique. 50 women with AFI <= 5cms were allotted in the study group and another 50 women with AFI 8-18 cms were included in the control group. Labour was either spontaneous or induced in both study and control groups. Mode of delivery and intra partum complications were noted. At birth neonates were assessed using 5min APGAR. Birth weight was recorded and neonates who were admitted in NICU were followed until discharge. This study suggests oligo-hydramnios, i.e AFI <= 5cms measured by ultrasound is associated with adverse perinatal outcome compared to those with AFI 8-18cms. So, early intervention in the form of induction of labor, close intra partum monitoring and early decision making regarding mode of delivery are the steps to be taken to prevent poor perinatal outcome.*

Keywords: *AFI, oligo hydramnios, perinatal outcome.*

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I. Introduction

Amniotic fluid volume as an indicator of foetal well being is very important in the course of pregnancy. The subject of amniotic fluid is seldom considered unless there is abnormality for e.g. too much (poly hydramnios, AFI >18 cms) or too little (oligo hydramnios, AFI <= 5cms) has circumstantially associated with variety of ominous pregnancy outcome such as perinatal death, foetal distress or poor infant condition at birth. In this study we sought to assess retrospectively whether ante partum oligo hydramnios (AFI <= 5cms) is associated with adverse pregnancy outcomes.

The incidence of oligo hydramnios is 2.3% as reported by Casey et al. Phelan et al defined oligo hydramnios as AFI <= 5cms, AFI 5-8 as borderline oligo hydramnios and 8-18cms as normal AFI. An AFI <= 5cms has been used as an indication for delivery.The factors which contribute to amniotic fluid entry and exit from amniotic sac for the late gestation are foetal urine, foetal swallowing and reabsorption by intestines, transfer across chorionic plate, secretion from respiratory tract, oronasal secretions and trans-membranous path way.The amniotic fluid volume varies with the gestational age. At the end of first trimester it is approx. 200ml. It raises progressively during gestation until 38-40 weeks after which it decreases. At term it measures approximately 900ml. After 40 weeks there is progressive decline in amniotic fluid volume averaging only 400ml at 42 weeks. Maternal disorders such as pre-eclampsia, diabetes, utero placental insufficiency, fetal disorders such as chromosomal abnormalities, congenital anomalies, IUGR, post term pregnancy, drugs such as prostaglandin synthetase inhibitors, ACE inhibitors etc. cause oligo hydramnios. In many cases of oligo hydramnios, the cause is unknown.

It was shown that using AFI, instead of a single pocket measurement in foetal bio physical profile, increases the sensitivity from 64.75% to 76.4% and positive predictive value of foetal bio physical profile from 45.8% to 68.45%. AFI can be repeated weekly if it is more than 8cms. When AFI is between 8 and 5 cms, evaluation should be performed twice weekly. With regard to intervention, the high incidence of meconium staining liquor and foetal distress among patients with AFI <= 5cms suggest that strong consideration for induction of labour should be given to patients whose AFI values drop to 5-7cms range on repetitive testing.

AFI measurement

Patient is kept in supine position. A linear, curvilinear, or sector transducer can be used. Divide the uterus into 4 quadrants using maternal sagittal midline vertically and an arbitrary transverse line approximately half way between 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 vertical pocket of amniotic fluid is visualized and the image is frozen. The process is repeated in each of the four quadrants and the pockets measured are summed up to get AFI in cms. If AFI is less than 8 cms, four quadrant evaluation is done thrice and average value is taken.

II. Material & Methods

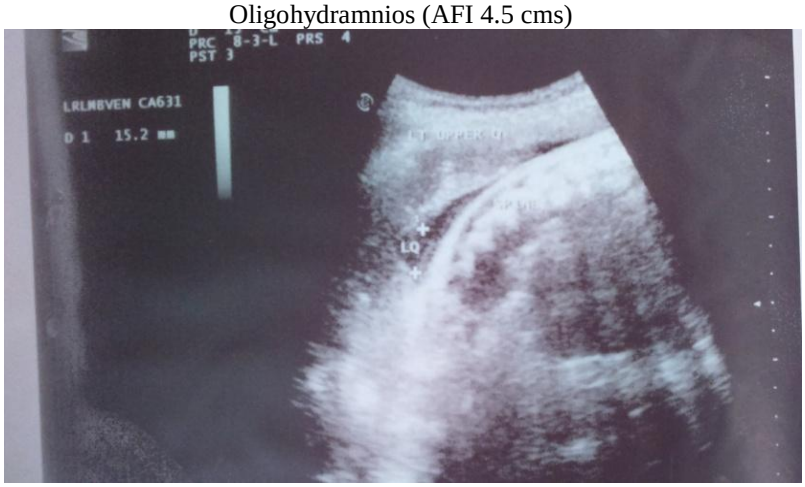
This prospective study was done in the department of Obstetrics & Gynaecology of Guntur Medical College, Guntur between January 2017 to September 2017. Our analysis included 100 antenatal women with gestational age 37 weeks and above attending out patient department/labour room. Detailed antenatal history was elicited from the patient and then they were subjected to clinical examination followed by ultrasonography. The AFI was measured by trans abdominal ultrasonography (TAUS) using four quadrant technique, as described by Phelan et al. 50 women with AFI <= 5 cms were included in the study group and another 50 women with AFI 8 to 18 cms were included as control group. Labour was either spontaneous or induced in both study and controlled groups. Progress of labour was monitored on partogram. Mode of delivery and intrapartum complications were noted. At birth neonate was assessed using 5 minute APGAR. Birth weight was recorded and neonates who were admitted into NICU were followed till discharge.

Inclusion Criteria

- Patients who are sure of their LMP
- Gestational age 37 weeks and above
- Singleton pregnancies with cephalic presentation
- Patients with AFI <=5 cms taken as cases and AFI 8 to 18 cms taken as controls
- Patients complaining of premature rupture of membranes were excluded from the study

Adequate liquor (AFI 11.8 cms)

Oligohydramnios (AFI 4.5 cms)



III. Results

A total number of 100 antenatal women with term pregnancy who had undergone both clinical and ultrasonographic assessment for the amount of liquor were recruited under present study. 50 women who had AFI <= 5 cms were included in the study group and another 50 women who had AFI 8 to 18 cms were taken as control group. Various factors were studies and compared between two groups.

Table 1: Booked & Unbooked Cases

	Study group (N=50)		Control group (N=50)	
Booked/unbooked	Number	%	Number	%
Booked	30	60	40	80
Unbooked	20	40	10	20

Table 2: Gestational Age & Its Influence Over Afi

Gestational age	Study Group (N=50)		Control group (N=50)	
	Number	%	Number	%
37-40 weeks	32	64	45	90
41 weeks	15	30	5	10
>42 weeks	3	6	-	-

Table 3: Incidence Of Pregnancy Induced Hypertension

Classification	Study group (N=50)		Control group (N=50)		Statistical significance
	Number	%	Number	%	
Mild PIH	24	48	7	14	P < 0.44
Severe	2	4	-	-	

Table 4: Induction Of Labour

Method of induction	Study group (N=50)		Control group (N=50)		Statistical significance
	Number	%	Number	%	
PGE_2	14	28	4	8	
Misoprostol	8	16	-	-	
Oxytocin	2	4	2	4	P < 0.05

Table 5 Mode Of Delivery In Induction Group

Group	Induced	Labour normal		Outlet forceps		Caesarian section	
		Number	%	Number	%	Number	%
Study (n=50)	30	6	25	4	12	20	66
Control (n=50)	6	4	66	-	-	2	33

Table 6 Mode Of Delivery In Spontaneous Group

Group	Spontaneous	Labour normal		Outlet forceps		Caesarian section	
		Number	%	Number	%	Number	%
Study (n=50)	20	7	35	4	15	8	40
Control (n=50)	44	20	45	2	4.5	13	29

Table 7 Indications Of Caesarian Section

Indications	Study group (n=50)		Control group (n=50)		Statistical significance
	Number	%	Number	%	
Foetal distress	20	40	5	10	
Others	9	18	10	20	
Total	29	58	15	30	P < 0.05

Table 8 Amniotic Fluid Index & 5 Min Apgar

APGAR	Study group (n=50)		Control group (n=50)		Statistical significance
	Number	%	Number	%	
0 – 3	3	6	-	-	
4 – 6	7	14	2	4	
7 -10	40	80	48	96	P < 0.03

Table 9 Nicu Admission & Meconium Aspiration Syndrome

	Study group (n=50)		Control group (n=50)		Statistical significance
	Number	%	Number	%	
NICU admission	17	34	4	8	P <0.4
MAS	3	6	-	-	

Table 10: Amniotic Fluid Index And Birth Weight

Birth weight In Kgs	Study group (n=50)		Control group (n=50)		Statistical significance
	Number	%	Number	%	
< 2	6	12	1	2	
2.1 - 2.5	28	56	12	24	
2.6 – 3	14	28	27	54	P < 0.005
> 3	2	4	10	20	

AFI is marginally more common in unbooked cases compared to booked cases (Tabel 1) indicating proper antenatal care with emphasis on amount of liquor clinically and early admission as per requirement reduces the number of cases with oligohydramnios. There is no significance difference found in the age group and parity of women among study and control groups.

The incidence of oligohydramnios was high as the gestational age increases. In this study beyond 40 weeks gestation the evidence of oligohydramnios was 36%. This association of prolonged pregnancy and oligohydramnios was found to be significant 0.05 by chi square test (Table 2). The incidence of PIH was high (52%) in study group compared to control group (14%) (Table 3). Hence, PIH can be attributed to be one of the aetiological factors of oligohydramnios. Induction of labour was significantly high in the study group (48%) compared to 12% in control group ($P < 0.05$). Labour was induced with PGE_2/PGE_1/oxytocin in both groups (Table4). The incidence of Caesarian section rate was high (66%) in study group compared to control graoup (33%) (Table 5). In the study group with spontaneous onset of labour pains, the incidence of instrumental deliveries (13%) and Caesarian section (42%) rates were high compared to control group (Table 6). In the study group labour was normal in 34% compared to control group (45%).

On analysing the indications for Caesarian section, foetal distress was found to be dominant indication in study group (40%) compared to control group (10%). The difference was found to be significant (P 0.5) (Table 7). Other indications of Caesarian section in both study and control groups were PIH, CPD and failed induction. When APGAR scores at 5 minutes were compared, 20% of cases in study group had APGAR less than 7 compared to 4% of cases in control group (Table 8). The incidence of NICU admissions in study group was 34% when compared to 8% in control group. The incidence of meconium aspiration syndrome was 6% in study group while it was nil in control group (table 9). The mean birth weight among study group was 2.4 kgs while it was 2.8 kgs among controls (table 10).

IV. Discussion

The increased incidence of oligohydramnios in unbooked cases shows the importance of antenatal checkups. There was no influence of age and parity over the amniotic fluid volume. In the present study incidence of oligohydramnios was high among post term pregnancies (30%). In a study by Phoolchandra et al it was 31.25%. In this study, 52% of study group had PIH. In a study by P M Elliot et al the incidence was 54%. Kamala Ganesh et al found a significant association between PIH and oligohydramnios. In the present study, 48% of the study group were induced when compared to a study by Casey et al (1990) which was 42%.

The incidence of meconium stained liquor in the study group was 36%. This is comparable to results of study by Debra et al (20%). The studies conducted by Erika et al and Patel et al showed the incidence to be 12% and 14% respectively. 20% of cases in study group had APGAR less than 7. Newborns requiring NICU admissions were 34% compared to 7% in a study by Casey et al. The incidence of low birth weight babies was 56%. In a study by Casey et al , the rate of low birth weight was 24%. Perinatal mortality was 2% in present study compared to 15% found by Casey et al.

V. Conclusion

The goal of antepartum foetal surveillance is to identify the foetus at risk. Amniotic fluid volume has been proved as an indirect measure of foeto-placental function and hence the estimation of AFI assists the obstetrician in risk assessment. AFI provides a most convenient and reproducible method of evaluating amniotic fluid volume. Oligohydramnios i.e. <= 5 cms measured by ultrasonography in term pregnancies is associated with adverse perinatal outcome. It signifies the need for prevention, early detection and timely intervention to prevent the associated complications. Proper antenatal care with emphasis on clinical and ultrasonographic assessment of liquor, preventing antenatal complications like PIH, post term pregnancies can probably reduce the incidence of oligohydramnios.

The risk of meconium staining liquor, intrapartum foetal distress, operative delivery and perinatal mortality are significantly higher in patients with AFI <= 5 cms compared to those with AFI 8 to 18 cms. Early intervention in the form of induction of labour, close intra partum monitoring and early decision making regarding the mode of delivery or the steps to be taken to prevent poor perinatal outcome. Immediately after birth proper resuscitation by a paediatrician is mandatory.

Hence it is concluded that four quadrant assessment of amniotic fluid volume is an useful adjunct to antepartum foetal surveillance.

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