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RESEARCH ARTICLE

OBSTETRIC AND PERINATAL OUTCOME & USEFULNESS OF UMBILICAL ARTERY DOPPLER VELOCIMETRY IN CASES OF OLIGOHYDRAMNIOS DIAGNOSED AFTER 34 WEEKS OF GESTATION

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ABSTRACT

Aim: To study the obstetrical and perinatal outcome and usefulness of umbilical artery Doppler velocimetry and AFI in oligohydramnios at or beyond 34 weeks of gestation.

Methods: This comparative randomized prospective study conducted among 150 pregnant women at 34 weeks to 42 weeks of gestation. AFI was measured by 4 quadrant technique and umbilical artery Doppler velocimetry done in cases with AFI \leq 5 cm and the results were statistically analyzed and compared.

Results: In control group mean AFI was 11.74 cm and in study group it was 4.18cm. Among control group LSCS was 46%, in group 1 and 2, 74% and 56% respectively. Occurrence of non reactive NST was more in oligohydramnios i.e. group 1 and 2 (42% & 28%) compared to 24% in control group. NICU admission were more in group 1 (58%) compared to group 2 (38%) and control group 22%.

Conclusion: AFI \leq 5 CM after 34 weeks of gestation is an indicator of poor perinatal outcome and umbilical artery Doppler velocimetry is helpful in identification of high risk cases and reduced perinatal morbidity and mortality.

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INTRODUCTION

Phelan defined oligohydramnios as amniotic fluid index (AFI) \leq 5cm. Oligohydramnios occurs in about 1-5% of pregnancies at 34 to 42 weeks of gestation (Phean *et al.*, 1987). Women with oligohydramnios are more associated with IUGR, non-reactive FHR tracing, cord compression, poor tolerance of the labor by fetus thus an increased incidence of LSCS (Voxman *et al.*, 2002). Oligohydramnios is also leading indication of labor induction (Achalabi *et al.*, 2006). Oligohydramnios is associated with high rate of pregnancy complications and increased perinatal morbidity and mortality. Thus AFI and umbilical Doppler velocimetry assessed antepartum would help to identify women who need increased antepartum surveillance for pregnancy complication and decreased perinatal morbidity and mortality (Jandial *et al.*, 2007).

MATERIALS AND METHODS

This was a comparative randomized prospective study conducted among 150 women with gestational age at or beyond

34 weeks at J.L.N. Medical College, Ajmer. Randomization done by lottery system for group 1 and group 2 for umbilical artery Doppler study. The inclusion criteria were women with gestational age of 34 weeks or more, intact membranes, singleton pregnancy with cephalic presentation and exclusion criteria were multiple pregnancy, fetal congenital anomalies, malpresentation and malposition and placenta previa. The women were divided in to three groups. First group consists of women with AFI less than or equal to 5 cm with study of umbilical artery doppler. Second group with only AFI less than or equal to 5 cm. The third group with AFI between 5 to 20cm which was taken as a control group. On admission after complete history and examination, routine investigation done as required for gestational age followed by ultrasound, NST, BPP done. Umbilical artery Doppler done in cases with PET, IUGR and AFI less than 5 cm. Documentation of obstetric intervention in the form of induction or augmentation of labor with prostaglandins or oxytocin and mode of delivery was done. Various outcome measures recorded were induction of labor, nature of amniotic fluid, indication of caesarean delivery, APGAR score at 1 and 5 minutes, birth weight, IUGR, admission to NICU, perinatal morbidity and mortality. The results were recorded and tabulated and statistically analyzed

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using parameters like mean, chi square test. Other parameters like sensitivity, specificity, positive predictive value, and negative predictive value were used at required observations.

RESULTS

In this study most of them were primigravida in all 3 groups. The mean gravity was 1.64 for group 1, 1.7 for group 2 and 1.56 for group 3 and mean gestational age for group 1,2,3 were 38.3 weeks, 38.7 weeks and 38.6 weeks respectively so the groups were comparable.

Incidence of LSCS was more in group 1 (74%) as compared to group 2 (56%) and control group (46%). ($\chi^2=16.158$, $p\leq 0.013$). (Table 1) LSCS is 87.7% when umbilical artery Doppler studies were abnormal and 65.5% when same are normal ($\chi^2=7.805$, $p\leq 0.005$). LSCS for fetal distress was more in study group 1 i.e. 42% as compared to 28% in group 2 and 20% in control which was statistically significant ($p\leq 0.027$). NICU admission in group 1 is 58%, in group 2 was 38% and in 3rd group 22% ($\chi^2=13.634$, $p\leq 0.001$) (Table 2). Tachypnoea was commonest indication for NICU admission in group 1 (31%) and group 2 (42%) and hyperbilirubinaemia (63%) in control group.

Table 1. Mode of delivery

Mode of delivery	Study Group 1		Study Group 2		Control Group		χ^2	p- Value
	N	%	N	%	N	%		
FTVD	11	22%	20	40%	30	60%	16.158	0.013
PTVD	2	4%	2	4%	0	0%		
LSCS	37	74%	28	56%	20	40%		
Vacuum delivery	1	2%	3	6%	6	12%		
Total	50	100%	50	100%	50	100%		

$\chi^2=16.158$, p value = 0.013

Table 2. NICU Admission

Admitted to NICU	Study Group 1		Study Group 2		Control Group	
	N	%	N	%	N	%
Admitted to NICU	29	58	19	38	11	22

$\chi^2 = 13.634$ p value = 0.001

Table 3. Showing indication for NICU admission

Reason for NICU admission	Group 1		Group 2	Control Group
	Normal Doppler	Abnormal Doppler		
Tachypnoea	4	5	8	4
Preterm management	1	4	2	0
Peripheral asphyxia	0	2	2	0
Meconium aspiration	2	2	5	3
Hyperbilirubinemia	4	1	8	7
B/o GDM mother	2	0	1	0
Sepsis	1	2	0	1
Convulsions	0	1	0	2
Feeding difficulties	0	0	1	1

Table 4. Birth weight

Birth weight (kgs)	Study Group 1		Study Group 2		Control Group	
	N	%	n	%	n	%
1 – 1.5	5	10	1	2	0	0
1.6 – 2	6	12	2	4	0	0
2.1 – 2.5	24	48	17	34	11	22
2.6 – 3	10	20	21	42	23	46
3.1 – 3.5	5	10	8	16	13	26
3.6 – 4	0	0	1	2	3	6

Group	Mean	Std dev	95% confidence interval for mean		Min	Max	F	p-value	Significance between
			Lower Bound	Upper Bound					
Study Group 1	2.35	0.57	2.19	2.52	0.80	3.50	18.213	<0.001*	Study group 2 & control Study group 1 Study group 2
Study Group 2	2.73	0.44	2.61	2.85	1.50	3.60			
Control Group	2.92	0.41	2.80	3.04	2.25	3.90			

Table 5. IUGR

Study Group 1		Study Group 2		Control Group	
N	%	N	%	N	%
27	54	14	28	5	10

Next indication was preterm, which was observed in 2 cases with abnormal umbilical artery Doppler finding (14.8%) in group 1. Meconium aspiration was more in group 2 (26%). This was statistically significant ($p \leq 0.001$) (Table 3). The mean birth weight for group 1 was 2.35kg, for group 2 was 2.73kg and for control group 2.92 kgs ($\chi^2=18.213$, $p \leq 0.001$) (Table 4).

IUGR	Study Group 1		Study Group 2		Control Group		χ^2	p value
	N	%	N	%	N	%		
Present	27	54	14	28	5	10	23.014	<0.001*
Absent	23	46	36	72	45	90		
Total	50	100	50	100	50	100		

IUGR was more in group 1 (54%) in group 2 (28%) and in control group (10%). 80% of neonates with abnormal Doppler finding had IUGR ($\chi^2=23.014$, $p \leq 0.001$) (Table 5).

DISCUSSION

In our Study comparison with other studies about oligohydramnios (AFI <5cm), our finding in group 1 and 2 are taken together. In the study by Cassey *et al.* (2000) the gestational age of delivery was 37.5 in weeks, in present study it was 38.3 and 38.7 weeks this result, while being statistically significant, correlate with our study. In the study by Kumar *et al.* (1991) 40% of patients had non-reactive NTSSs, while in the study by Chandra *et al.* (2000), 69.23% and in the study Sriya *et al.* (2001), it was 41.55%, in our study 70% had non-reactive NST. These studies show that more than half of patients with AFI ≤ 5 cm had non-reactive NSTs. While comparing the incidence of delivery by LSCS in the study and control group (65% vs 46%), in the study by Jandial *et al.* (2007), 56% patient LSCS. Induction of labor were higher in study group ($p \leq 0.001$), Rainford *et al.* (2001) ($p \leq 0.001$), Jandial *et al.* (2007) and Gumus *et al.* (2007), had a similar finding. These studies shows that oligohyramnios is an independent indication for induction of labor in most institutes. The incidence of low birth weight less than 2.5kg (55%) was comparable with Chandra *et al.* (2000) 61.53% and Sriya *et al.* (2001) 58.38%. NICU admission 78% in our study for various indication was comparable with Sriya *et al.* (2001) 88%. In present study, out of 50 cases with oligohyramnios with Doppler, 29(58%) had normal umbilical artery doppler velocimetry and adverse perinatal outcome was 35.7% and 42% had abnormal umbilical artery Doppler with adverse perinatal outcome is 73.3% which is comparable with Carroll *et al.* (1998), which had 38.3% abnormal Doppler finding and 74% had adverse perinatal outcome.

Conclusion

An AFI of ≤ 5 cm detected after 34 weeks of gestation is an indicator of poor perinatal outcome.

In the presence of oligohyramnios, the occurrence of non-reactive NST, abnormal FHR tracing during labor and thick meconium-stained liquor; development of fetal distress; the rate of LSCS; low 5-min APGAR score; low birth weight; and perinatal mortality are high. Umbilical artery Doppler velocimetry is very useful in identification of high risk cases in oligohyramnios and perinatal outcome improved significantly. Determination of AFI is a valuable screening test for predicting poor perinatal outcome and fetal distress and neonatal prognosis can be significantly improved with Umbilical artery doppler velocimetry.

REFERENCES

- Achalabi, H.A., Obedat, B.R., Jallad, M.F., *et al.* 2006. Induction of labor and perinatal outcome: the impact of the amniotic fluid index. *Eur J Obstet Gynecol Reprod Biol.* 129(2):124-7.
- Carroll, B.C., Bruner, J.P. 1998. Umbilical artery Doppler as a predictor of perinatal outcome in pregnancies complicated by oligohydramnios. *Am J Obstet Gynecol* Jan; 178:86.
- Casey, B.M., M.C. Intire, D.D., Donald, D., *et al.* 2000. Pregnancy outcome after diagnosis of oligohydramnios at or beyond 34 weeks of gestation. *Am J Obstet Gynecol*; 182: 902-12.
- Chandra, P., Kaur, S.P., impact of Hans D.K., *et al.* 2000. The impact of amniotic fluid volume assessed intrapartum on perinatal outcome. *Obstet Gynaecol.* 5:178-81.
- Gumms, II, Koktener, A., Turhan, N.O. 2007. Perinatal outcomes of pregnancies with borderline amniotic fluid index. *Arch Gynecol Obstet.* 276:17-9.
- Jandial, C., Gupta, S., Sharma, S. *et al.* 2007. Perinatal outcome after antepartum diagnosis of oligohydramnios at or beyond 34 weeks of gestation. *JK Sci* ;9.
- Kumar, P., Iyer, S., Ramkumar, V. 1991. Amniotic fluid index –a new ultrasound assessment of amniotic fluid. *J Obstet Gynaecol India*; 41:10-2.
- Phean, J.P., Smith, C.V., Broussard, P. *et al.* 1987. Amniotic fluid volume assessment with four quadrant technique at 36-42 weeks of gestation. *J Reprod Med*; 32:540-2.
- Rainford, M., Adair, R., Scialli, A.R., *et al.* 2001. Amniotic fluid index in the uncomplicated term pregnancy. Prediction of outcome. *J Reprod Med.* 46:589-92.
- Sriya, R., Singhai, S., Rajan, M., *et al.* 2001. perinatal outcome in patients with amniotic fluid index: 5 cm. *J Obstet Gynaecol India.* 51:98-100
- Voxman, E.G., Tran, S., Wing, D.A. 2002. Low amniotic fluid index as a predictor of adverse perinatal outcome. *J Perinatol.*, 22:282-285.
