

Pregnancy Outcomes of Oligohydramnios at Term diagnosed by Ultra Sonography (USG): A Case Control study

Dr. Priya Sonkhya¹*, Dr. Nilima Gupta², Dr. Premlata Mittal³

¹Assistant Professor, Department of Gynecology & Obstetrics, SMS Medical College, Jaipur (Rajasthan) India

²Senior Professor, Department of Gynecology & Obstetrics, Dr. Vasant Rao Pawar Medical College & research Centre, Adgaon Nasik (Maharashtra) India

³Senior Professor, Department of Gynecology & Obstetrics, SMS Medical College, Jaipur (Rajasthan) India

Abstract— *This study was conducted to find out if AFI ≤ 5 cms has any clinical significance in identifying the subsequent fetal distress & associated maternal & perinatal outcomes, in pregnancies beyond 37 weeks.*

Methodology: *This is a prospective case control study done from July 2010 to July 2012 (24 months) at Dr Vasant Rao Pawar Medical College, Hospital and Research Center. Adgaon, Nashik. It study the pregnancy outcome comparison of 58 Antenatal Cases(ANCs) as Study Group with diagnosis of oligohydramnios (AFI ≤ 5 cms) by ultrasound after 37 completed weeks of gestation were compared with 58 ANCs (Control Group) with no oligohydramnios (AFI > 5 cms). These two groups were matched for other variables like age, parity, gestational age and any pregnancy complication.*

Results: *There was significant difference between two groups. Hypertension and Preeclampsia were found significantly more in ANCs with oligohydramnios. FHR deceleration was also significantly higher in women with oligohydramnios. Women require LSCS were also significantly more in women with oligohydramnios. Newborn borned by women with oligohydramnios had significantly more chances to admit in NICU than in newborn born by women without oligohydramnios.*

Conclusion: *It can be concluded from this study that women with oligohydramnios poor pregnancy outcomes. Determination of AFI can be used as an adjunct to other fetal surveillance methods. Determination of AFI can be used as valuable screening test for predicting fetal distress in labour, requiring caesarean section.*

Key Words: *Amniotic fluid index, Oligohydramnios, Fetal Distress.*

I. INTRODUCTION

Amniotic fluid which surrounds developing fetus in amniotic sac provides several benefits to the fetus.¹ Despite decades of investigations, the regulation of amniotic fluid volume and composition remains incompletely understood. This results in part from the complexities inherent in the amniotic fluid dynamics, an enigmatic interaction of several sites of amniotic fluid secretion and excretion.

Amniotic fluid volume at anytime is the balance between production and consumption. There is a large variation of the amniotic fluid within the same subject as it is a dynamic reservoir. It increases rapidly in the first half of pregnancy reaching a mean of 200 ml by 16 weeks, 1000 ml by 28 weeks, 900ml by 36 weeks and reaching a mean of 800 ml by 40 weeks and then decreases thereafter to less than 200ml at 42 weeks (Queenan 1991).²

The definition of oligohydramnios has varied according to the various techniques used for measuring amniotic fluid volume by different investigators. Phelan³ who described amniotic fluid index defined oligohydramnios as an AFI less than 5cm. Manning et al⁴ defined oligohydramnios when the largest pocket measured on ultrasound in its broadest diameter measured less than 1 cm .

It is a common obstetric complication, occurring in 0.5 to >5% pregnancies depending on the definition of oligohydramnios used and the population studied.⁵ The incidence increases to approximately 11% in postdate pregnancies.⁶

Amniotic fluid volume is considered an important marker of adequate placental function. The purpose of taking group of women with oligohydramnios at term pregnancies are because the etiology, management and the outcome is different in late onset oligohydramnios compared to early onset oligohydramnios.

Appreciation of importance of amniotic fluid volume as an indicator of fetal status and oligohydramnios as an indicator of chronic fetal hypoxia is a relatively recent development. Improvements in ultrasonographic techniques have made it possible to assess the amniotic fluid volume relatively accurately. The technique of four quadrant method of calculating amniotic fluid index (AFI) described by Phelan et al. in 1987 is accepted by most of the authors.³

Many studies show that oligohydramnios is associated with variety of ominous pregnancy outcomes, such as fetal distress, low birth weight, perinatal morbidity, perinatal mortality and increased incidence of caesarean section.

However, some studies show that amniotic fluid index is a poor predictor of adverse outcome and even the existence of an entity like isolated term oligohydramnios has been questioned by some authors. Thus this study is conducted to find out the value of oligohydramnios in determining maternal morbidity & perinatal outcome in pregnancies beyond 37 completed weeks.

II. METHODOLOGY

This is a prospective case control study done from July 2010 to July 2012 (24 months) at Dr. Vasantrao Pawar Medical College, Hospital and Research Center, Adgaon, Nashik. It consists of analysis of pregnancy outcome in 58 ANCs (Study Group) with diagnosis of oligohydramnios (AFI \leq 5 cms) by ultrasound after 37 completed weeks of gestation which was compared with 58 ANCs (Control Group) with no oligohydramnios (AFI $>$ 5 cms). These two groups were matched for other variables like age, parity, gestational age and any pregnancy complication prior to include in study.

2.1 Inclusion criteria

Singleton non anomalous pregnancy with cephalic presentation with 37 completed weeks of gestation irrespective of parity with amniotic fluid index of \leq 5 cm at admission in labour room or observation ward with Intact membranes in the study group and ANCs with AFI $>$ 5 cm were included in control group.

2.2 Exclusion criteria

Gestational age less than 37 completed weeks with any associated proven fetal malformations, ruptured membranes, malpresentation and multiple gestation. Exclusion criteria were same for both the study group and the control group.

For all the selected ANCs, complete history was taken and antenatal examination was done. Previous antenatal records and ultrasound reports were reviewed. Only those women who had good or excellent dates with thirty seven completed weeks of gestation were included in study. For all the selected women, ultrasound examination was done and amniotic fluid index was calculated by four quadrant amniotic fluid volume measurement technique. According to AFI, women were divided in study and control group. Baseline investigations like Hb%, blood group and Rh typing, HIV, HBsAg,

VDRL, fasting blood sugar, urine examination and admission NST was done for all ANCs.

The management protocol was similar in both study group and control group. Written and informed consent of the patient was taken. Those women who had high risk factors like preeclampsia, post date pregnancy and non reactive NST, were induced using dinoprostone gel (PGE₂) or oxytocin. Women with no other risk factors were allowed for spontaneous onset of labour and alternate day NST and weekly BPP were done. All ANCs were monitored by continuous electronic fetal monitoring in labour. The nature of amniotic fluid was noted at the time of artificial rupture of membrane and was classified as clear or meconium stained liquor. Those who developed significant variable decelerations and repetitive late decelerations or other ominous FHR pattern with or without meconium stained liquor which persisted inspite of corrective measures like change in maternal position, hydration, O₂ inhalation and stopping oxytocin were delivered accordingly either by LSCS or instrumental delivery. All newborns were attended by neonatologists and endotracheal intubation was done in presence of thick meconium stained amniotic fluid.

Various outcome measures recorded were, induced Vs spontaneous labor, gestational age at delivery, nature of amniotic fluid, FHR tracings, mode of delivery, indication for cesarean section or instrumental delivery apgar score at one minute and five minutes, birth weight, admission to neonatal ward, perinatal morbidity and mortality.

2.3 Statistical Method

Data thus collected were entered in MS Excel worksheet 2007 as master chart. These data were tabulated and analysed as per objectives. For significance of difference in means of both groups Unpaired 't' Test was used and for significance of difference in proportions of both groups Chisquare test was used. Significant level was set at $p \leq 0.05$.

III. RESULTS

The average age of ANCs in the study group was 23.5 yrs and in the control group it was 22.69 yrs ($P > 0.05$). The mean AFI for study group was 3.65 cm. and that for control group it was 9.30 cm. Both the groups were similar regarding gravidity, gestational age and presence of antenatal complications. The mean gestational age for the study group was 39.55 weeks and that for control group it was 39.59 weeks ($P > 0.05$). (Table 1)

Table 1
Comparison of Characteristics of the subjects in Study and Control Group

S. No.	Variables	Study Groups (N=58)	Control Groups (N=58)	*P Value	**LS
1	Age ≤20 Yrs 21-30 Yrs	16 (27.49%) 42 (48.28%)	18 (31.03%) 40 (68.97%)	0.838	NS
2	Gravidity Primigravida Multigravida	28(48.28%) 30(51.72%)	31(53.45%) 27(46.55%)	0.710	NS
3	Gestational Age 37-40 Wks 41-42 Wks	39(67.24%) 19(32.76%)	40(68.97%) 18(31.03%)	0.950	NS

*P Value with Chisquare Test

**LS is level of significance

Preeclampsia and hypertension were found significantly more (<0.01) in study group than control group (32.76% v/s 10.34% and 31.03% v/s 3.45% respectively). Although postdatism was also higher in study

group as compared to control group but significant level was not calculated as proportion of postdatism was zero in control group although it was 12.07% in study group. (Table 2)

Table 2
Comparison of ANC Complications of the subjects in Study and Control Group

S. No.	Variables	Study Groups (N=58)	Control Groups (N=58)	*P Value	**LS
1	Preeclampsia	19 (32.76%)	06(10.34%)	0.007	S
2	Postdatism	07(12.07%)	00(0%)	NC	
3	Hypertension	18 (31.03%)	2 (3.45%)	<0.001	S

*P Value with Chisquare Test

**LS is level of significance

Although non reactive NST and FHR deceleration were found more in study group (34.48% and 58.62% respectively) as compared to control group (18.97% and 31.03% respectively) but it was found significantly more (p<0.01) in FHR deceleration only. (Table 3)

Occurrence of meconium stained liquor & induction of labour was also found significantly higher (p=0.018 and p<0.001 respectively) in study group than control group (58.62% v/s 20.69% and 44.83% v/s 22.41% respectively). Rate of LSCS / Instrumental delivery was also observed significantly more (p<0.001) in study group as compared to control group (51.72% v/s 24.14% respectively). (Table 3)

Table 3
Comparison of Maternal Pregnancy Outcomes of Study and Control Groups

S. No.	Variables	Study Groups (N=58)	Control Groups (N=58)	*P Value	**LS	
1	NST	Non-reactive	20(34.48%)	11(18.97%)	0.093	NS
		Reactive	38(65.52%)	47(81.03%)		
2	FHR Decelerations	Present	34(58.62%)	18(31.03%)	0.005	S
		Absent	24(41.38%)	40(68.97%)		
3	Labour	Induces	26(44.83%)	13(22.41%)	0.018	S
		Spontaneous	32(55.17%)	45(77.59%)		
4	Colour of Liquor	Clear	24(41.38%)	46(79.31%)	<0.001	S
		Meconium Stained	34(58.62%)	12(20.69%)		
5	Mode of Delivery	Vaginal Delivery	18(31.03%)	44(75.86%)	<0.001	S
		LSCS/ Instrumental	30(51.72%)	14(24.14%)		

*P Value with Chisquare Test

**LS is level of significance

Although occurrence of APGR score <7 at 1 minute and 5 minutes were found higher in study group than control group (34.48% v/s 17.24% and 17.24% v/s 5.17% respectively) but it was not found significant. Likewise low birth weight (<2.5 kg) were seen more in study group (41.38%) as compared to control group(24.14%) but it was also not found significant. Increased admission to NICU was seen significantly more (p<0.01) in study group than control group (37.93% v/s 12.07%). There was no significant difference in neonatal death proportion in both the groups (p>0.05). (Table 4)

Table 4
Comparison of Newborn Pregnancy Outcomes of Study and Control Groups

S. No.	Variables	Study Groups (N=58)	Control Groups (N=58)	*P Value	**LS	
1	APGAR score <7	One Minute	20(34.48%)	10(17.24%)	0.056	NS
		5 Minuts	10(17.24%)	3(5.17%)		
2	Birth Weight (Kg)	<2.5	24(41.38%)	14(24.14%)	0.075	NS
		≥2.5	34(58.62%)	44(75.86%)		
3	Admission to NICU	Yes	22(37.93%)	7(12.07%)	0.003	S
		No	36(62.07%)	51(87.93%)		
4	Neonatal Death	Yes	04(6.89%)	02(3.45%)	0.675	NS
		No	54(93.11%)	56(96.55%)		

*P Value with Chisquare Test

**LS is level of significance

IV. DISCUSSION

Amniotic fluid index is a reliable indicator of amniotic fluid volume and an AFI of ≤ 5 cm on antenatal screening of patient with or without high risk pregnancy has been associated with adverse perinatal outcomes. The demographic profile of the women in both study group and control group was comparable. Mean age of women in study group was 23.25 years while it was 22.69 years in control group. This difference in age in both the groups was statistically not significant. Well comparable study population was in a study conducted by Baron et al.⁷

Hypertension was found significantly more in ANCs with oligohydramnios i.e. 31.03% cases in study group than 3.45% of cases in control group of this present study. This observation was almost similar to that of Sriya et al.⁸ While hypertension was observed in higher proportion in present study than that of Casey et al.⁹

Postdated pregnancy was found in 12.07% ANCs of the study group of present study whereas it was nil in control group. This observation was well in resonance with that of Casey et al.,⁹ while Sriya R⁸ reported a much higher rate of postdatism in women with oligohydramnios.

Preeclampsia was also found in significantly more in ANCs with oligohydramnios i.e. 32.76% cases in study group than 10.34% of cases in control group of this present study. This observation was almost similar to that of Sriya et al.⁸

In present study, occurrence of non reactive NST (34.48%), FHR deceleration (58.62%) were higher in women with oligohydramnios although it was found significant only in FHR deceleration. Similar observations were noted by various studies like Rutherford et al., Sriya et al., Karim R et al., Alchalabi HA et al and Bachhav Asavari A et al.^{8,10,11,12,14}

In this study group 51.72% women in required LSCS for fetal distress. Well comparable observations were made by various studies.^{8,9,11,12,13,14,15..}

Occurrence of APGAR score of <7 at 5 min(17.24%), low birth weight (41.38%) & admission to NICU (37.93%) was found higher in women with oligohydramnios although it was significant only in NICU admission. Admission to NICU had variable incidence as reported by other authors.^{8,9,11,14} Sriya et al. Reported a very high incidence (88.88%) of NICU admission while Casey et al. reported only 7% incidence of NICU admission.

Neonatal mortality was reported 6.89% in study group and 3.45% in control group in this study while there was no neonatal death in the study conducted by Baron et al. & Casey et al.^{11,8} This may be because of good NICU facilities available at their centre.

V. CONCLUSION

It can be concluded from this study that Hypertension and Preeclampsia were found significantly more in ANCs with oligohydramnios. FHR deceleration was also significantly higher in women with oligohydramnios. Women require LSCS were also significantly more in women with oligohydramnios.

Newborn borned by women with oligohydramnios had significantly more chances to admit in NICU than in newborn born by women without oligohydramnios.

CONFLICT OF INTEREST

None declared till now.

REFERENCES

- [1] Williams's obstetrics. 23rd edition pg 353,490,491
- [2] Queenan JT. Polyhydramnios and oligohydramnios. *Contemp Obstet Gynecol.* 1991; 36: 60
- [3] Phelan JP, Smith CV, Small M. Amniotic fluid volume assessment with the four quadrant technique at 36-42 weeks gestation. *J Reprod Med.* 1987; 32: 540-42
- [4] Manning FA, Hill LM, Platt LD. Qualitative amniotic fluid volume determination by ultrasound: antepartum detection of intrauterine growth retardation. *Am J Obstet Gynecol.* 1981; 139: 254-8
- [5] Zhang J, Troendle J, Meikle S, Klebanoff MA, Rayburn WF. Isolated oligohydramnios is not associated with adverse perinatal outcomes. *Br J Obstet Gynaecol.* 2004 Mar; 111(3): 220-25.
- [6] Locatelli A, Vergani P, Toso L, Verderio M, Pezzullo JC, Ghidini A. Perinatal outcome associated with oligohydramnios in uncomplicated term pregnancies. *Arch Gynecol Obstet.* 2004 Jan; 269(2): 130-33
- [7] Colleen B, Morgan M, Garite TJ. The impact of amniotic fluid volume assessed intrapartum on perinatal outcome. *Am J Obstet Gynecol.* 1995;173: 167-74.
- [8] Sriya R, Singhai S, et al. Perinatal outcome in ANCs with amniotic fluid index ≤ 5 cm. *J Obstet and Gynaecol of India.* 2001; 51(5): 98-100.
- [9] Casey BM, MC Intire DD, Donald D, et al. Pregnancy outcome after diagnosis of oligohydramnios at or beyond 34 weeks of gestation. *Am J Obstet Gynecol.* 2000; 182: 902-12
- [10] Rutherford SE, Jeffrey P, Phelan J, Smith CV, Jacobs N. The four quadrant assessment of amniotic fluid volume: An adjunct to antepartum fetal heart rate testing. *Obstet Gynecol.* 1987; 70: 353
- [11] Colleen B, Morgan M, Garite TJ. The impact of amniotic fluid volume assessed intrapartum on perinatal outcome. *Am J Obstet Gynecol.* 1995;173: 167-74.
- [12] Alchalbi HA, Obeidat BR, Jallad MF, Khader YS. Induction of labour and perinatal outcome: the impact of amniotic fluid index. *Eur J Obstet Gynecol Reprod Biol.* 2006 Dec; 129(2):124-7.
- [13] Leeman L, Almond D. Isolated Oligohydramnios at term : Is induction indicated? *The J Fam Practice.* 2005 Jan; 54(1):25-32
- [14] Asavari BA, Waikar M. Low amniotic fluid at term as a predictor of adverse perinatal outcome. *J Obstet Gynaecol India.* 2014;64(2) : 120-123
- [15] Ahmed H, Munim S. Isolated oligohydramnios is not an indicator for adverse perinatal outcome. *J Pak med assoc.* 2009;59:691