



PREGNANCY OUTCOME IN AMNIOTIC FLUID INDEX LESS THAN 5 AT TERM LOW RISK PREGNANCY

Dr Mansi Shrigiriwar

Department Of Obstetrics & Gynaecology, Government Medical College, Nagpur, Maharashtra-440009

Dr Shrikant Khandekar*

Department Of Obstetrics & Gynaecology, Government Medical College, Nagpur, Maharashtra-440009 *Corresponding Author

ABSTRACT

BACKGROUND: To study the maternal and perinatal outcome in oligohydramnios of AFI(amniotic fluid index) ≤ 5 cm at term in low risk pregnancy

METHODS: A Prospective case control study consists of an analysis of pregnancy outcome in 102 cases with diagnosis of oligohydramnios (≤ 5) after 37 to 41 weeks 6 days completed is compared with 102 controls with pregnant women AFI > 5 .

RESULTS: There is increased chances of oligohydramnios with primigravida. The selected outcomes showed significant variations in both groups with increase rate of caesarean section, fetal distress, and NICU admission.

CONCLUSIONS: An amniotic fluid index of ≤ 5 cm detected after 37 completed weeks of gestation is an indicator of maternal and poor perinatal outcome. In method of fetal surveillance determination of AFI can be important.

KEYWORDS : Perinatal Outcome, Oligohydramnios, Afi < 5 Cm, Maternal Outcome

INTRODUCTION

Oligohydramnios is a serious complication of pregnancy, that is integrated with a poor perinatal outcome. It complicates 1-5% of term pregnancies (1). Over all incidence is 3.9% of all pregnancies. Oligohydramnios is defined as amniotic fluid index less than 5th percentile for the gestational age (Moore and Cayle) or AFI less than or equal to 5cm regardless of gestational age. (Phelan)

It can be classified as mild, moderate & severe Oligohydramnios when deepest pocket devoid of cord /fetal limbs measuring $< 3, 2,$ or 1 cm, respectively. (1)

Normal amniotic fluid index is between 8.1-20cm.(2) Borderline Oligohydramnios is defined as amniotic fluid index between 5.1-8cm.

Manning et al defined oligohydramnios when largest pocket on ultrasound in its broadest diameter measured < 1 cm. They revised the criteria to a single pocket measuring 2cm in both vertical/horizontal plane.(3)

Amniotic fluid is an important part of pregnancy sac and helps in fetal development(4). It surrounds the foetus and provides protective low resistance environment suitable for fetal growth and development (5). It also protects fetus from trauma, maintains body temperature and it has bacteriostatic properties. Its pressure helps in reducing the loss of lung fluid and assist in pulmonary development(6). It supports development of musculoskeletal system by permitting foetal movements in addition to the growth and development of gastrointestinal system by swallowing amniotic fluid(7).

Oligohydramnios is found to be associated with increased frequency of maternal & fetal complications.(8) It may be associated with uteroplacental insufficiency, preeclampsia, hypertension, diabetes, cardiac disease, congenital anomalies, idiopathic fetal growth restriction, fetal hypoxia etc. Oligohydramnios, in a pregnancy without fetal renal abnormality or genitourinary obstruction is thought to represent chronic in utero stress The impact of oligohydramnios on maternal & fetal outcome can be significant.(9)

Complication of oligohydramnios a)Maternal- Prolonged labour, Malpresentation, Caesarean delivery, Instrumental delivery, Protracted labour, Premature rupture of membrane b)Fetal- Meconium aspiration syndrome, Septicaemia, Fetal Pulmonary hypoplasia, Cord compression, Deformity, Perinatal mortality, NICU admission Low APGAR, abortion

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By diagnosing such cases early & timely intervention can prevent most of the complications. In case of irreversible complications having occurred, termination of pregnancy can be considered.

OBJECTIVE OF THE STUDY

To assess the fetal and maternal outcome at term in low risk pregnancy with AFI ≤ 5 .

MATERIALS AND METHODS

The prospective, case and control study conducted at Government Medical College, Nagpur, Maharashtra from Dec 2017 to Nov 2019. In study 102 pregnant women with oligohydramnios (AFI ≤ 5) as case group and 102 pregnant women with AFI > 5 as control group. All the low risk cases that are available up to the study period is taken for the purpose of the study. Consent from the patient is taken and ethical clearance taken from the Ethical Committee.

This study includes an analysis of mode of delivery, meconium passage, birth weight, Apgar score, neonatal intensive care unit admissions and neonatal deaths.

INCUSION CRITERIA:

1. AFI ≤ 5
2. Single live intrauterine gestation with cephalic presentation
3. 37 completed weeks of gestation
4. Intact membrane.
5. Low risk pregnancy

EXCLUSION CRITERIA

1. AFI more than 5
2. Gestational age < 37 completed weeks
3. Post-term (more than 42 weeks)
4. Associated fetal malformations
5. Ruptured membranes
6. Malpresentation and multiple gestation
7. pregnancy with maternal diseases like Hypertension in pregnancy, Diabetes, Chronic renal disease, Connective tissue disorders.
8. Any other obstetric complications.

The patients is selected after detail clinical history and exami

nation such as age, height, weight, BMI, weight gain, marital status, duration of amenorrhea, booked/referral ,number visits, detail obstetric history, menstrual history, regarding previous congenital abnormalities, oligohydramnios or major medical disorders complicating pregnancy like diabetes, cardiac disease, hypertensive disorders, anaemia, chronic renal diseases, etc.

All patient the low risk pregnancy included having AFI≤5 on sonography and completed 37 weeks of gestation.

Besides baseline characteristics, indication for induction and the method of induction is noted.

METHODOLOGY FOR INDUCTION-AUGMENTATION IN OUR STUDY:

Bishop score <6
PGE1 25- 50µg vaginally/orally repeated after 2-4hours if necessary (10) or Foleys induction.

& Bishop score >7 -ARM(artificial rupture of membrane)

Titrated oxytocin infusion: dose dependant on uterine response Study conducted on women with uncomplicated oligohydramnios at term with amniotic fluid index 5 cm and a low Bishop score <-6 who underwent induction of labor with prostaglandin E2.

Indication for caesarean section in our study are:-Fetal distress, Failed induction, Meconium stained liquor with fetal distress, Obstetric indication (failure to progress)

OBSERVATIONS

This study was conducted in Department of Obstetrics & Gynaecology at tertiary care hospital from Dec 2017 to Nov 19. The observation & results of this study are shown below in form of tables and graphs.

Case group - Patient with AFI ≤ 5.
Control group -Patient with AFI >5.

Table no 1: -Inter group comparison of mean age in case and control group

	groups	N	Mean	Std. Deviation
AGE	case	102	24.96	±4.275
	control	102	25.62	±4.450

Table no 2: -Age distribution of patients

Age (years)	Groups			Chi square value	p value of chi square test
	Cases	Control	Total		
<20	4	7	11	2.904	0.407#
21-25	59	48	107		
26-30	23	30	53		
>30	16	17	33		
Total	102	102	204		

Table no 3-description of patient according to gravida.

Gravida	Groups			Total	Chi square value	p value of chi square test
	Cases	Controls	Total			
1	64(62.74)	54(52.94)	118	2.046	0.360#	
2	33(32.35)	41(40.19)	74			
3	5(4.91)	7(6.87)	12			
Total	102	102	204			

Table no 4-NST (Non stress test) in groups

NST		Groups		Total	Chi square value	p value of chi square test
		Cases	Controls			
NR	NR	11(10.78%)	8(7.84%)	19	0.522	0.470#
	R	91(89.22%)	94(92.16%)	185		
	Total	102	102	204		

NR- NON-REACTIVE R-REACTIVE

Table no 5-Mode of induction in study various methods

	Case	Control
Misoprostol	12	59
Foley's	90	74
ARM	95	85
Oxytocin	87	84

Table no 6-Mode of delivery in study

MODE OF DELIVERY	NORMAL	LSCS
CASE	23(22.54%)	79(77.46)
CONTROL	71(69.60%)	31(30.40%)

Table no7- outcome of pregnancy in case and control groups

		Groups	
		Cases	Controls
MATERNAL OUTCOME OF STUDY AND INDICATIONS OF LSCS	FTND	23(22.54)	71(69.6)
	FD	40(39.21)	15(14.70)
	MSL FD	15(14.70)	7(6.86)
	VF	13(12.74)	3(2.94)
	CPD	3	2
	DTA	1	1
	FI	1	2
	FP	6	1
	Total	102	102

FTND-full term normal delivery, FD-fetal distress, MSL-meconium stained with liquor, VF-variable fetal heart rate, CPD-cephalopelvic disproportion, DTA-deep transverse arrest, FI-failure of induction, FP-failure to progress

Table no 8-APGAR at 5min in groups of study.

5" APGAR		Groups		
		Cases	Controls	Total
<7	<7	12(11.76)	6(5.88)	18
	≥7	90(88.24)	96(94.12)	176
	Total	102	102	204

Table no 9-NICU Admission of neonates

	Case	Control
Mother side	90(88.24)	96(94.12)
NICU admission	12(11.76)	6(5.88)
Total	102	102

Table no 10-Mortality of neonates in study

	Case	Control
NO	102	102
YES	0	0

DISCUSSION

Accurate antepartum estimation of amniotic fluid volume by clinical means alone is difficult, but it is easily diagnosed by current ultrasound methods. Identification of oligohydr amnios women with sonography not difficult in modern era. This helps us to be more cautious and anticipate problems especially during labor.

Reduced amniotic fluid at term is generally considered to have increased risk of intrapartum complications. The risk is

further compounded in high risk pregnancies. However, the quantum of risk with reduced amniotic fluid is less clear in low risk pregnancies. Many studies shown conflict between results. Reduced AFI in low risk pregnancies that is isolated reduction in amniotic fluid in the presence of intact membranes and with no other risk factors is not a common finding

VARIABLE	Casey et al 2000 (11)	Sriya & Singhai 2001 (12)	Mangal p. et al 2017 (13)	Purvi .p et al 2014 (14)	Preshit Chate et al 2012 (15)	PKaur et al 2015 (16)	Vibha Moses 2016 (17)	Maya Al .bayatti 2002 (18)	Tamiru Minwuye Et al 2017(19)
Non-reactive Nst		41.35%	32%	65%	38%	38%			
Vaginal Delivery			24%	18.75%	36%	52%	58%	30%	19.7%
LSCS			76%	81.25%	64%	48%	42%	70%	80.3%
Fetal Distress	51%	43.05%					14%	27%	
MSL	54%	38.88%	14%	51.25%	46%	50%	12.5%	42%	
Apgar <7 @5"		58.38%	28%	20%	16%	40%	16.3%	16%	1.7%
Nicu Admission	7%	88.88%	16%	20%	42%	40%	35%		11.86%
Mortality					2%	8%	3.33%		
Birth Weigth <2.5kg	35%	58.38%	18%		62%				

PARAMETER	K. Jagatia et al 2011(20)	R. Ghosh et al 2017(21)	Sowmya. K et al 2012(22)	PGaikwad et al 2016(23)	Present study 2019
NON-REACTIVE NST	32%		12%	42.8%	10.78%
VAGINAL DELIVERY	58%	50.9%	32%	26.6%	22.54%
LSCS	42%	49.1%	68%	73.4%	77.4%
FETAL DISTRESS	21%		50%	1%	53.91%
MSL			32%		14.70%
APGAR<7 @5"	15%	43.6%	14%	15%	11.76%
NICU ADMISSION	22%		14%	22%	11.76%
MORTALITY	2%	3%	0	2%	0%
BIRTH WEIGHT <2.5KG		70.9%	70.9%		18.63%

Most of patients in study is between 21 to 25 years of age group in both case (57.84%) and control (47.05%) and least number of patients were ≤20 years (i.e.3.92% and 6.86%). And mean age in case group-24.96±4.275 and control group-25.62±4.450.

Among study primigravida is 62.74% in case group and 52.94% in control group and patient with 3rd gravida was less. In study booked and referral patients number was almost same.

The non-reactive NST high rates in women with AFI <5 cm. The rate of non-reactive NST is 10.78% in present study and is less compared to that in similar study by Purvi p.et al ,Chandra et al. (24), Sriya and Singhai, , & Sowmya.k et al with 68% ,69.23%, 41.55% & 12% respectively.

Various studies show different rate of caesarean section in pregnant women with amniotic fluid index of <5 cm. The LSCS rate in case group was 77.48% and in control group 30.40% with compare to other studies casey et at, Mangal puri et al, Purvi k. Patel et al, Maha al. bayatti et al,T. minwuye. et al, Pgaikwad et al, Sowmya .k et al and ghosh et al was 32%,76%,81.25%,70%,80.3%,73.4%,68% and 49.10% respectively.

In our study mode of delivery was compared between the two groups and it was found that in group with oligohydramnios normal delivery was 22.54% and with non-oligohydramnios was 69.40%. and this comparable to other studies of Mangal puri et al-24%,purvi k. Patel et al-18.25%,maha al. bayatti et al -30%,T. minwuye et al-19.7%,p. gaikwad et al-26.6% and Sowmya .k et al-32%.

In this study occurrence of meconium stained liquor seen in 14.70% for that LSCS done for better outcome of newborn, and this is compare to Casey et al. 54%, Mangal puri et al. 14%, Pkaur 50%, & vibha mooses 12.5% .

Among patients of caesarean section most of patients indication was fetal distress .In our study 53.91% patients within case LSCS done for fetal distress of that meconium stained liquor with fetal distress was 14.70%,similarly in control 21.56% patient undergone LSCS out of which MSL FD was 6.86%.In others studies LSCS for fetal distress was casey et at 51%,sriya and singhai et al 43.05%,vibha mooses et al 14%,maha al. bayatti et al 27%,T. minwuye.p. gaikwad et al 34.6% and Sowmya .k et al-50% .

The 5 min Apgar score <7 is seen in 11.76% of oligohydramnios group and control group of 5.88 % which required NICU admission. 11.76% and 5.88% of newborns were

admitted in the neonatal ward for various morbidities like birth asphyxia, meconium aspiration, etc. This is consistent with studies by mangal purvi et al 28%, purvik, Patel et al 20% ,and Casey et al 7%. A study by Sriya and Singhai et al and Pkaur et al showed a higher incidence of 58.38% and 40%.

We studied the perinatal outcome in the two groups and compared the NICU admissions in both the groups. In our study 11.76% of neonates had NICU admissions in oligohydramnios group compared to 5.88 % in AFI >5 group and difference was not found to be statistically significant in between the two groups. Casey et al at 7%, sriya and singhai et al 88.88%, purvi k. patel et al 20%, T. minwuye-11.86%, P. gaikwad et al 28.5%, mangal puri et al 16% and Sowmya .k et al 14%.

Birth weight below 2.5 kg neonates in case is 18.63% and control group is 16.66% ,comparing to other studies this less. In casey et at, sriya and singhai et al, mangal puri et al, P chate et al, T. minwuye, p. gaikwad et al and Sowmya .k et al is 35%, 58.38%, 18%, 62%, 11.5%, 67.3% and 48% respectively

In this study there is no mortality of neonates in both groups compare to other studies in which mortality was present like Pchate et al 2%, vibha mooses et al 3.33% and P. kaur et al 8%.

RESULT

- 1) Mean age of the women is 24.94 ± 4.275 years in case and 25.62 ± 4.45 . Most of the patients is between 21 to 25 years (57.84% and 47.05%) and the least number of patients is ≤ 20 years (3.92% and 6.86%) in case and control groups.
- 2) 62.74% and 52.94% of patient are primigravida in case and control groups. So primiparity is probably more associated with oligohydramnios, though statistically not significant.
- 3) Mode of induction in our institute was combined i.e misoprostol, foley's, ARM, and oxytocin. For better fetal outcome LSCS is done in study
- 4) Most common indication for LSCS in both groups is fetal distress i.e 53.91% (case) & 21.56% (control).
- 5) In case group maximum patient has LSCS as mode of delivery, while in control group mode of delivery was vaginal delivery
- 6) Occurrence of meconium (14.7%), failure of induction (0.98%), failure to progress (5.88%), CPD (2.94%) AND variable FHS (12.74%) is minor indication in study.
- 7) Variable FHS is more common in case group 12.74% than 2.94% control group.
- 8) NST and FHS by doppler or stethoscope are used for fetal record. Non-reactive NST is 10.78% in case and 7.84% in control.
- 9) From above inferences we understand that probably oligohydramnios leads to increased intrapartum fetal compromise.
- 10) Only % 11.76% and 5.88% neonates have APGAR <7 at 5min and all of these neonates are admitted to NICU. But there was no neonatal death in this study.

RECOMMENDATION

All of above studies recommend AFI measurement at or after 37 weeks of gestation in low risk pregnancy is considered as one of the very sensitive method for fetal surveillance.

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