

A Prospective Observational Study Determining the Feto-Maternal Outcome in Oligohydramnios

Mamta Rani

Senior Resident, Department of Obstetrics and Gynaecology, Bhagwan Mahavir
Institute of medical Sciences, Pawapuri, Nalanda, Bihar, India

Received: 10-12-2022/ Revised: 25-12-2022 / Accepted: 25-01-2023

Corresponding author: Dr. Mamta Rani

Conflict of interest: Nil

Abstract

Aim: The aim of the present study was to determine the feto-maternal outcome in oligohydramnios.

Methods: A prospective study was conducted of all ANC'S admitted in labor room in Obstetrics and Gynaecology, BMIMS, Pawapuri, Nalanda, Bihar, India for two years. All the admitted term patients underwent ultrasound examination to assess the liquor. Amount of liquor was calculated using four quadrant method where deepest pockets in each quadrant was measured and their sum gives the AFI. Out of 4254 patients two hundred antenatal women at term had AFI of less than 8cms and were included in the study.

Results: In our study 60% of women were aged between 20-29 years, 30% were >30 years and only 10% were less than 20 years. Number of Primigravidas and multigravidas were almost equal each being 52% and 48% respectively. Majority of the cases were between 37 to 40 weeks of gestation constituting 80% and 20% were between 40 to 42 weeks. Out of 200 antenatal women Non-reassuring NST was seen in 36% of cases, 45% had prolonged labour, intrauterine growth restriction was found in 10%, malpresentations were seen in 4%, fetal anomalies in 2% and 3% had postpartum hemorrhage. Borderline AFI was seen in 65% and 34% had severe oligohydramnios. Clear liquor was demonstrated in 75% of cases, thin meconium stained liquor was seen in 18% and 5% had thick meconium stained liquor. Out of 200 patients 60 underwent cesarean section i.e. 30%. Fetal distress was seen in 15%, CPD in 5%, 4% of malpresentations, 3% had failed induction and deep transverse arrest occurred in 1%. Out of 200 babies delivered birth weight was >3kg in 60 neonates (30%), 100 (50%) were between 2 to 3 kgs and 40 (20%) between 1 – 2 kg. low apgar score i.e. <7 was seen in 50 newborns (25%) and 60 (30%) babies required NICU admission.

Conclusion: Oligohydramnios is associated with high rate of pregnancy complications and increased perinatal morbidity and mortality. AFI assessed ante partum, and intrapartum would help to identify women who need increased ante partum surveillance for pregnancy complications. Women with oligohydramnios usually have lower birth weight babies but can expect a safe and good outcome with proper fetal surveillance and timely intervention.

Keywords: Oligohydramnios; Maternal Outcome; Fetal Outcome.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Amniotic fluid acts like a cushion and helps in growth of fetus in sterile environment, regulates temperature, avoid external injury

and reduce impact of uterine contractions. Usual amount of amniotic fluid is approximately 1000ml at term. Volume of

amniotic fluid decreases with increasing gestational age. Decrease in amniotic fluid volume is called as oligohydramnios. Causes of Oligohydramnios are pregnancy induced hypertension (PIH), postdate pregnancy, infections, congenital anomalies like renal agenesis, idiopathic, etc. Oligohydramnios may lead to increased risk of intrauterine growth retardation (IUGR), meconium aspiration syndrome, severe birth asphyxia, low APGAR scores and congenital abnormalities.[1]

Oligohydramnios is defined as an amniotic fluid index (AFI) of 5 cm or less or Small deepest fluid pocket (SDP) of less than 2 cm. SDP is a measure of the single deepest pocket of fluid. Each individual pocket of fluid should be 2 to 8 cm. In multiple pregnancies, SDP for each fetus is typically reported.[2] Causes of Oligohydramnios are pregnancy induced hypertension (PIH), postdate pregnancy, infections, congenital anomalies like renal agenesis, idiopathic, etc. Oligohydramnios may lead to increased risk of intrauterine growth retardation (IUGR), meconium aspiration syndrome, severe birth asphyxia, low APGAR scores and congenital abnormalities.[3] Oligohydramnios increases maternal morbidity by increasing rates of induction and/ or operative interference.[4] With the help of amniotic fluid estimation by amniotic fluid Index (AFI) using four quadrant technique during transabdominal USG, as per described by Phelan et al in 1997.[5]

During antenatal fetal surveillance, amniotic fluid assessment is a crucial barometer to know the fetal status.[6] Primal sonographic sign of an obstetrical issue is abnormal amniotic fluid volume.[7] Normally during third trimester, around 3% to 8% of pregnant women are anguishing from low amniotic fluid at any point of pregnancy. It is normally anticipated as a sign of placental insufficiency.[8] Most severe and frequent complication of pregnancy is Oligohydramnios and the incidence of this

is observed to be about 1-5% of total pregnancies.[9] Associate congenital fetal abnormalities with oligohydramnios are uteroplacental insufficiency, premature rupture of membranes, growth retardation, post term pregnancy, chronic abruption placentae.[6] As per definition of liquor assessment an AFI less than 5cm is known as oligohydramnios, AFI from 5 to 8 cm has been termed borderline AFI.[10] Oligohydramnios is associated with increased fetal malformations and in the absence of malformations, to be complicated by fetal growth restriction, maternal morbidity and adverse perinatal outcome.[11] Hence every case of oligohydramnios needs careful antenatal evaluation, parental counseling, individualized decision regarding timing and mode of delivery, continuous intrapartum fetal monitoring and good neonatal care for optimum perinatal outcome.[12]

The aim of the present study was to determine the fetomaternal outcome in oligohydramnios.

Materials And Methods

A prospective study was conducted of all ANC'S admitted in labor room in Obstetrics and Gynaecology, BMIMS, PAWAPURI, Nalanda, Bihar, India for two years. All the admitted term patients underwent ultrasound examination to assess the liquor. Amount of liquor was calculated using four quadrant method where deepest pockets in each quadrant was measured and their sum gives the AFI. Out of 4254 patients two hundred antenatal women at term had AFI of less than 8 cms and were included in the study. Maternal & neonatal outcome was observed in terms of AFI, obstetric complications, mode of delivery, Apgar score at delivery, birth weight, NICU admission and perinatal morbidity and mortality.

Inclusion Criteria

Gestational age 37-42 weeks of gestation
Amniotic fluid Index: <8 cm Fetus with no

obvious congenital anomaly Intact membranes at the time of admission.

Exclusion Criteria

- Women with Premature Rupture of Membranes before admission
- Multiple pregnancies Gestational age < 37 weeks
- Antepartum hemorrhage
- Fetal anomalies Maternal risk factors

Study was conducted to observe outcome of labour in form of perinatal morbidity and maternal outcome in form of induction and deliveries: (1) To study affects Oligohydramnios on fetal outcome in form of – (a) Fetal distress, (b) Growth retardation, (c) NICU admission; (2) To study APGAR scores of newborn babies in

relation to Oligohydramnios; (3) To study incidence of congenital malformation; (4) To study early neonatal morbidity and mortality; (5) To study maternal morbidity in form of operative delivery and induced labour. A detailed history and examination were done. All required investigation done. Oligohydramnios confirmed by measuring AFI. Routine management in form of rest, left lateral position, oral and intravenous hydration and control of etiological factor was done if present. Fetal surveillance was done by USG, modified Biophysical profile and Doppler. Decision of delivery by either induction or elective or emergency LSCS was done as per required. Some patients were already in labour and other allows going in spontaneous labour. Cases were than studied for maternal and perinatal outcome.

Results

Table 1: Maternal and gestational age with parity of the study population

		No of patients with AFI <8 cm	Percentage
Maternal age	<20 years	20	10%
	20 to 29 years	120	60%
	>30 years	60	30%
Parity	Primigravida	104	52%
	Multigravida	96	48%
Gestational age	37 to 40 weeks	160	80%
	40 to 42 weeks	40	20%

In our study 60% of women were aged between 20-29 years, 30% were >30 years and only 10% were less than 20 years. Number of Primigravidas and multigravidas were almost equal each being 52% and 48% respectively. Majority of the cases were between 37 to 40 weeks of gestation constituting 80% and 20% were between 40 to 42 weeks.

Table 2: Obstetric complications and Amniotic fluid characteristics

Complications	No of patients with AFI < 8 cm	Percentage
Malpresentation	8	4%
IUGR	20	10%
NST-non reassuring	72	36%
Prolonged labor	90	45%
Fetal anomalies	4	2%
PPH	6	3%
Amniotic fluid		
AFI 5-8 cm	130	65%
AFI <5 cm	68	34%
Clear	150	75%

Thin meconium	36	18%
Thick meconium	20	5%

Out of 200 antenatal women Non-reassuring NST was seen in 36% of cases, 45% had prolonged labour, intrauterine growth restriction was found in 10%, malpresentations were seen in 4%, fetal anomalies in 2% and 3% had postpartum

hemorrhage. Borderline AFI was seen in 65% and 34% had severe oligohydramnios. Clear liquor was demonstrated in 75% of cases, thin meconium stained liquor was seen in 18% and 5% had thick meconium stained liquor.

Table 3: Indications for cesarean section

Indications for cesarean	No of patients with AFI < 8 cm	Percent (%)
Fetal distress	30	15%
CPD	10	5%
Mal-presentation	8	4%
Deep transverse arrest	2	1%
Failed induction	6	3%
Total	60	30%

Out of 200 patients 60 underwent cesarean section i.e. 30%. Fetal distress was seen in 15%, CPD in 5%, 4% of malpresentations, 3% had failed induction and deep transverse arrest occurred in 1%.

Table 4: Perinatal and Neonatal outcomes

Outcomes	Number	Percentage (%)
Birth weight		
1 – 2 kg	40	20%
2 - 3 kg	100	50%
>3 kg	60	30%
Apgar scores < 7	50	25%
Nicu Admissions	60	30%
Observation for 48 hrs	34	17%
RDS	48	24%
Mechanical ventilation	8	4%
Sepsis	20	10%
Jaundice	6	3%
Anomalies	4	2%
Death	4	2%

Out of 200 babies delivered birth weight was >3kg in 60 neonates (30%), 100 (50%) were between 2 to 3 kgs and 40 (20%) between 1 – 2 kg. low agar scores i.e. <7 was seen in 50 newborns (25%) and 60 (30%) babies required NICU admission.

Discussion

Quantitative estimation of amniotic fluid volume is a part of routine obstetric scan.

Semi quantitatively the amount of amniotic fluid is described using the amniotic fluid index. Oligohydramnios occurs in about 1% to 5% of pregnancies at term. Amniotic fluid surrounds the developing fetus. Its existence plays an essential role in fetal development.[13] At first, amniotic fluid is mainly water with electrolytes, but by about the 12- 14th week the liquid also contains proteins, carbohydrates, lipids and

phospholipids and urea, all of which aid in the growth of the fetus.[14]

In our study 60% of women were aged between 20-29 years, 30% were >30 years and only 10% were less than 20 years. Number of Primigravidas and multigravidas were almost equal each being 52% and 48% respectively. Majority of the cases were between 37 to 40 weeks of gestation constituting 80% and 20% were between 40 to 42 weeks. These findings are comparable with the study done by Biradar KD et al, Patel PK et al but contrast result was found in study done by Vidyasagar et al (80.49%).[15-17] Almost 35.5% participants were Primigravida. In similar study done by Biradar et al, Vidya Sagar et al and Patel RK et al, where Primigravida participants were 33.0%, 46.3% and 35.8% respectively.[15-17]

The incidence of oligohydramnios was 4.70% among the 4254 number of deliveries in our hospital in contrast to 3.8% observed by Rhoades JS et al.[18] Out of 200 babies delivered birth weight was >3kg in 60 neonates (30%), 100 (50%) were between 2 to 3 kgs and 40 (20%) between 1 – 2 kg. low agar scores i.e. <7 was seen in 50 newborns (25%) and 60 (30%) babies required NICU admission. Casy et al reported 6.4% perinatal death. In our study perinatal mortality was 2%.[19] Better identification of fetus at high risk is done. Increased induction of labour and elective caesarean deliveries are currently practiced for better perinatal outcome. Early detection of oligohydramnios and its management may help in reduction of maternal & fetal morbidity and mortality. The measurement and its comparison to the index are important in helping to determine fetal and maternal health.

The finding of oligohydramnios can be associated with fetal anomalies, pre mature rupture of membranes, uteroplacental insufficiency (e.g. growth retardation, postdatism, abnormal placentation, maternal systemic illness etc.), and multiple pregnancies or can be idiopathic.

Ultrasound detection of this complication should prompt the clinician to thoroughly evaluate the mother for hypertension, diabetes or other medical comorbidities. In addition, a thorough fetal anatomic survey focusing on the genitourinary tract and an attempt at visualizing free amniotic bands should be performed with ultrasound. Oligohydramnios and perinatal morbidity and mortality has been well established by Manning et al.[20]

Conclusion

Oligohydramnios is associated with high rate of pregnancy complications and increased perinatal morbidity and mortality. AFI assessed ante partum, and intrapartum would help to identify women who need increased ante partum surveillance for pregnancy complications. Women with oligohydramnios usually have lower birth weight babies but can expect a safe and good outcome with proper fetal surveillance and timely intervention. Due to intrapartum complication and high rate of perinatal morbidity and mortality, rates of caesarean section are rising, but decision between vaginal delivery and caesarean section should be well balanced so that unnecessary maternal morbidity prevented and other side timely intervention can reduce perinatal morbidity and mortality.

References

1. Dasari P, Niveditta G, Raghavan S. The maximal vertical pocket and amniotic fluid index in predicting fetal distress in prolonged pregnancy. *Int J Gynaecol Obstet* 2007;96(2):89-93.
2. Ross I, Silver R I, Beverly G.C. Chapter 71 - Obstetric Ultrasound: Second-Trimester Imaging Radiology Secrets Plus (Third Edition).2011:503-509.
3. Sultana S, Akbar Khan MN, Khanum Akhtar KA, Aslam M. Low amniotic fluid index in high-risk pregnancy and poor apgar score at birth. *J Coll Physicians Surg Pak* 2008;18(10):630-4.

4. Rainford M, Adair R, Scialli AR, Ghidini A, Spong CY. Amniotic fluid index in the uncomplicated term pregnancy. Prediction of outcome. *J Reprod Med* 2001;46 (6):589-92.
5. Phelan JP, Smith CV, Broussard P, Small M. Amniotic fluid volume assessment using the four-quadrant technique in the pregnancy at 36-42 weeks gestation. *J Reprod Med* 1987;32(7):540-2.
6. Bansal D, Deodhar P. A clinical study of maternal and perinatal outcome in oligohydramnios. *J Res Med Den Sci*. 2015;3(4):312-6.
7. Williams Obstetrics. Cunningham FG, Gant NF, Leveno KJ, Gilstrap LC III, Hauth JC, Wenstrom KD: 21st Edition USA; McGraw Hill. Fetal Growth and Development. Chapter 7:142-3.
8. Gaikwad PR, Oswal MS, Gandhewar MR, Bhatiyani BR. Perinatal outcome in oligohydramnios and borderline amniotic fluid index: a comparative study. *Int J Reprod Contracept Obstet Gynecol*. 2016; 5:1964-8.
9. Moore TR. Clinical assessment of amniotic fluid. *Clin Obstet Gynaecol*. 1997;40(2):303-13.
10. Patel PK, Pitre DS, Gupta H. Pregnancy outcome in isolated oligohydramnios at term. *National Journal of Community Medicine*. 2015 Jun 30;6(02):217-21.
11. Preshit Chate. et al. Pregnancy outcome after diagnosis of oligohydramnios at term. *Int J Reprod Contracept Obstet Gynecol*. 2013; 2(1):23-26.
12. Kahkhaie KR, Keikha F, Keikhaie KR, Abdollahimohammad A, Salehin S. Perinatal outcome after diagnosis of oligohydramnios at term. *Iranian Red Crescent Medical Journal*. 2014 May;16(5).
13. Asnafi N, Bouzari Z, Mohammadnetadj M. Oligohydramnios and pregnancy outcome: ten-years review. *International Biological and Biomedical Journal*. 2015 Feb 10;1(1):23-8.
14. Fedakâr A, Semiz S, Peker N. Clinical features of babies born to mothers with oligohydramnios: a two years' experience. *Journal of Pregnancy and Child Health*. 2016;3(2).
15. Biradar KD, Shamanewadi AN. Maternal and perinatal outcome in oligohydramnios: study from a tertiary care hospital, Bangalore, Karnataka, India. *Int J Reprod Contracept Obstet Gynecol*. 2016; 5:2291-4.
16. Vidyasagar V, Chutani N. Fetomaternal outcome in cases of oligohydramnios after 28 weeks of pregnancy. *Int J Reprod Contracept Obstet Gynecol*. 2015; 4:152-6.
17. Patel PK, Pitre DS, Gupta H. Pregnancy outcome in isolated oligohydramnios at term. *Ntl J Commun Med*. 2015;6(2):84-8.
18. Rhoades JS, Stout MJ, Macones GA, Cahill AG. Effect of Oligohydramnios on Fetal Heart Rate Patterns during Term Labor Induction. *American journal of perinatology*. 2019 Jun;36(07):715-22.
19. Casey BM, McIntire DD, Bloom SL, Lucas MJ, Santos R, Twickler DM, Ramus RM, Leveno KJ. Pregnancy outcomes after antepartum diagnosis of oligohydramnios at or beyond 34 weeks' gestation. *American journal of obstetrics and gynecology*. 2000 Apr 1;182(4):909-12.
20. Manning FA, Platt LD, Sipos L. Antepartum fetal evaluation: Development of a fetal biophysical profile. *Am J Obstet Gynecol*. 1980; 136(6):787-95.