

The effect of abnormal amniotic fluid volume (oligohydramnios) on maternal and fetal outcome: an observational study

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Abstract

Aims: To study the effects of abnormal amniotic fluid (oligohydramnios) on maternal and fetal outcome. **Material and Methods:** This prospective observational study was carried out in the Department of Obstetrics and Gynecology at Patna Medical College and Hospital Patna, Bihar India, from November 2017 to February 2019. All pregnant women having singleton pregnancy with cephalic presentation, at POG 34-40 weeks, presenting with abnormal liquor (oligohydramnios) AFI less than 5, were included in the present study. **Results:** 85% of patients were in 20-30 years age group and 9% patients were in above 30 years age group. Mean maternal age was 23.61 years. Incidence of oligohydramnios was more in primipara (55%) in our study. And operative morbidity was also more in primipara 54.55%. Most common cause of Oligohydramnios is idiopathic (55%). Second commonest cause is PIH (28.5%). Operative morbidity is highest in PIH (52.64%). Operative morbidity was significantly higher in NST non-reactive (58.62%) group than NST reactive (27.46%) group. All patients underwent Doppler study. 10% were found with fetoplacental insufficiency. Most common reason to perform caesarean section was fetal distress which was either due to cord compression or IUGR. Oligohydramnios was related to higher rate of growth retardation and NICU admission. **Conclusion:** Oligohydramnios is frequent occurrence and demands intensive fetal surveillance and proper antepartum and intrapartum care. 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 be prevented and on the other side timely intervention can reduce perinatal morbidity and mortality.

Keywords: Oligohydramnios, Maternal Outcome, Fetal Outcome.

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Introduction

Modern obstetrics is the clinical practice concerned with the health and wellbeing of both mother and fetus. Identification and quantification of fetal risk, further balancing the fetal risk against the neonatal complications of premature birth, determining the

optimal time of intervention and quantification of maternal morbidity associated with intervention are the basis of management in obstetrics.

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.[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

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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.[5] in 1997, 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.

In this study we tried to see the type of delivery conducted in the form of normal vaginal delivery, assisted vaginal delivery or caesarean section in all patients of oligohydramnios having different age groups and parity. We studied different causes of oligohydramnios. Fetal surveillance was done by NST and Doppler study. Outcome of baby was studied by IUGR, APGAR score, NICU admission or perinatal mortality.

Material and Methods

This prospective observational study was carried out in the department of Obstetrics and Gynecology at Patna Medical College and Hospital Patna Bihar, India from November 2017 to February 2019, after taking the

Results

Table 1: Age and maternal outcome of labour

Age	Vaginal Delivery	%	Caesarean Delivery	%
< 20	10	83.33	2	16.67
20-30	110	64.70	60	35.3
> 30	7	38.88	11	61.12

Table 2: Parity and Maternal Outcome of Labour

Parity	Vaginal Delivery	%	Caesarean Delivery	%
Primipara	50	45.45	60	54.55
Multipara	77	85.55	13	14.45

approval of the protocol review committee and institutional ethics committee.

Methodology

All pregnant women having singleton pregnancy ,with cephalic presentation, at POG 34-40 weeks, presenting with abnormal AFI were included in the present study. Parturients complicated with PROM, malpresentations, antepartum hemorrhage, previous CS, myomectomy, hysterotomy and the antenatal mothers requiring elective CS for medical and obstetric conditions not related to amniotic fluid variations were excluded from the study. Informed written consent was obtained from all the patients before including them in the study.

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 others were allowed to go in spontaneous labour. Cases were than studied for maternal and perinatal outcome.

Table-3: Associated Condition and Maternal Outcome of Labour

	Vaginal Delivery	%	Caesarean Delivery	%
Pregnancy Induced Hypertension	27	47.36	30	52.64
Postdates	20	66.67	10	33.33
Fever	3	100	0	
Idiopathic	77	70	33	30

Table-4: Non-Stress Test (NST)

NST	Vaginal Delivery	%	Caesarean Delivery	%
Reactive	103	72.54	39	27.46
Non-reactive	24	41.38	34	58.62

Table-5: Doppler

Doppler	Vaginal Delivery	%	Caesarean Delivery	%
Normal	123	68.33	57	31.67
Abnormal	4	20	16	80

Table-6: Indication of Caesarean Section

Indication	Percentage %
Fetal distress	24%
Oligohydramnios	11%
FPI, IUGR	7%
Breech	3%
Other	2%

Table-7: Outcome of Baby

Outcome	N
Growth retardation	81 (AGA); 19 (SGA)
APGAR score < 7 in 1 to 5 mins	34
NICU admission	49

Table-8: Attributes Related to Domestic Violence

Outcome	NST reactive	NST Non Reactive
Live	135	51
Neonatal death	7	7

Discussion

In Casey et al.[6], the mean maternal age was 23.9 years which is comparable to the present study. In Donald D et al.[7], the incidence of oligohydramnios was 60% in primigravida which is comparable to present study as it was 55%. Sir Gangaram Hospital study[8] shows 68% vaginal deliveries in induced patients of oligohydramnios and 32% by caesarean section which is comparable to our study. Manzanares S et al.[9] shows 84% vaginal deliveries in induced patients of oligohydramnios and 16% by caesarean section. In this study, in spite of non-reactive NST, 41.38% patients delivered vaginally. The caesarean section was done

more commonly in 755 patients with non-reactive NST as seen in Charu Jandial study.[10] As these patients had oligohydramnios, a non-reactive NST + AFI <5 indicated fetal jeopardy as per revised Biophysical profile scoring by Clerk et al.[11] The fetal jeopardy was reflected as increase operative interference in this study. The operative morbidity is significantly higher in patients with altered Doppler study. In Weiss et al.[12] and Yound HK et al.[13], it was 71% and 69.7% respectively which was comparable to this study. It was comparable to Gramellini D et al.[14] where amnioinfusion was significantly gestation and reduced neonatal mortality. In present study, 38% babies had weight < 2.5 kg. Mean birth weight was 2.31 kg which

is similar to the study conducted by William Ott et al.[15] with the mean birth weight was 2.4 kg. The incidence of low birth weight babies is higher in oligohydramnios except in post maturity where the babies may have average birth weight. In Julie Johnson et al.[16], 92.6% babies were AGA and 7% were SGA. In Brain M Casey et al.[17] 75.5% AGA and 24% SGA. In Philipson EH et al.[18] 60% AGA and 40% SGA. In Manning et al.[19] 64% AGA and 36% SGA. In Raj Sariya et al.[20] 83.4% AGA and 16.6% SGA. This high percentage of SGA babies suggesting correlation of IUGR with Oligohydramnios. In Manning et al.[19] 15% babies had APGAR score < 7. In Raj Sariya et al.[20], it was 38%. In Julie M Jhonson et al.[21] 20% babies had NICU admission. In Manning et al.19 and Raj Sariya et al.[20], 43% and 88.88% respectively. Golan et al.[21] show 6.3% neonatal death in deliveries of oligohydramnios patients which is 7% observed our study.

Conclusion

Oligohydramnios is frequent occurrence and demands intensive fetal surveillance and proper antepartum and intrapartum care. Oligohydramnios is a frequent finding in pregnancy involving IUGR, PIH and pregnancy beyond 40 weeks of gestation. Amniotic fluid volume is a predictor of fetal tolerance in labour and its decrease is associated with increased risk of abnormal heart rate and meconium stained fluid. 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.

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