Original Article

A Study of Pregnancies Complicated by Decreased Amniotic Fluid with Maternal and Fetal Outcome in Combined Military Hospital Dhaka

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Abstract

Introduction: Decreased amniotic fluid volume below the normal range expected for the gestational age is a challenging entity encountered by obstetricians. Normal range of amniotic fluid is Amniotic Fluid Index (AFI) 8-20cm. Amniotic Fluid Index (AFI) is a quantitative estimation of amniotic fluid volume seen and measured by ultrasonography during pregnancy. AFI is the sum of the deepest vertical pocket of fluid, excluding fetal parts and umbilical cord, in four quadrants between the maternal midline vertically and transverse line half way between the pubic symphysis and uterine fundus. Decreased AFI has different etiology, pathophysiology, presentation and effect on fetomaternal outcome.

Objectives: To assess the incidence, aetiology, time and mode of delivery as well as to evaluate fetomaternal outcome associated with decreased amniotic fluid.

Materials and Methods*:* Prospective observational study was carried out among 60 cases of pregnancy at 3rd trimester with decreased amniotic fluid index admitted in the Department of Obstetrics and Gynaecology, Combined Military Hospital, Dhaka Bangladesh from October 2012-March 2013. Amniotic fluid index was determined by the four quadrant ultrasonography technique on admission. Variables used are parity, gestational age, AFI, the colour of amniotic fluid, etiology and mode of delivery. Neonatal outcome variables were birth weight, APGAR scores at Iand 5 minutes and admission to the neonatal intensive care unit.

Results*:* This study showed that 6% of the admitted patients were presented with decreased amniotic fluid. Among them 42% were borderline and 58% were severe oligohydramnios. Termination by caesarean section is high especially among the severe oligohydramnios patients 29 of 34. High rate of caesarean section is primarily due to fetal distress 60%. There was no maternal morbidity but there was 32% fetal morbidity.

Conclusion*:* Decreased amniotic fluid volume has no significant effect or maternal morbidity other than increased rate of caesarean section, however there was significant neonatal morbidity mainly due to birth asphyxia, others are neonatal sepsis and meconium aspiration syndrome.

Key-words: Amniotic fluid volume, Amniotic fluid index, Caesarean section, Birth asphyxia.

Introduction

A lot of hope and expectations lie in a pregnancy but during pregnancy there is risk from its beginning to its end. Perinatal mortality and morbidity invades lots of sufferings for the family as well as for the society. Decreased amniotic fluid volume is one of the conditions where normal pregnancy can turn into a high risk one, which facilitates increased operative interference and also associated with high perinatal mortality and morbidity.

The mechanism of amniotic fluid production and turnover are complex. Several factors including fetal swallowing, micturition, respiratory tract secretion and transudation from maternal circulation in the placenta, work in combination to produce a normal amniotic fluid that bathes the fetus and is necessary for its proper growth and development.

Oligohydramnios can develop at any trimester, although it is more common in third trimester[1]. Normal range of amniotic fluid AFI 8-20cm. Oligohydramnios refers to amniotic fluid volume is less than 5th percentile[2]. Ultrasonographically determined by identification of the largest pocket of fluid measuring less than 2cm x 2cm or the total of 4 quadrant less than 5cm[3]. The patient with AFI between 5.1-8cm have moderate Oligohydramnios and the patient who have AFI less than or equal to 5cm have severe Oligohydramnios[4].

Clinically in oligohydramnios uterine size is much smaller than the period of amenorrhoea. The uterus is full off foetus because of scanty liquor. Sonographically an accurate diagnosis of Oligohydramnios became possible by ultrasonographic evaluation of amniotic fluid index during pregnancy from 20 weeks to 42 weeks of pregnancy[3]. Worldwide Oligohydramnios Incidence: 8.2-37.8% pregnancies. Among antenatal patient (50% due to post term) of laboring patients (50% due to PROM)[5].

Amniotic fluid provides the foetus with fluid and nutrients that protects the foetus from trauma, has antibacterial properties. An adequate volume of amniotic fluid is critical to allow normal foetal movement and growth, and to cushion the foetus and umbilical cord[6]. Oligohydramnios may inhibit these process and can lead to foetal deformation, umbilical cord compression and foetal death[5]. The earlier in pregnancy amniotic fluid volume decreases poorer the outcome.

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The detectable common etiology of Oligohydrannios are premature rupture of fetal membrane, congenital abnormalities of the fetal urinary tract like renal agenesis, urethral obstruction, twin-twin transfusion syndrome, postmaturity, certain maternal health problems high blood pressure and certain medication[7]. During labour Oligohydramnios is found to be associated with an increased risk of caesarean delivery for foetal distress, cord compression, meconium stained liquor, low APGAR score and high perinatal mortality and morbidity[8]. About 8% of pregnant women can have low level of amniotic fluid, with about 4% being diagnosed as oligohydramnios[9]. Serno et al had a significantly higher rate of caesarean section for fetal distress and low APGAR score for those with AFI<5cm[10]. In a significant number of cases no apparent cause is detected.

To find out incidence, aetiology, maternal and foetal outcome of Oligohydramnios this study was planned. Successful reduction of maternal and perinatal morbidity and mortality associated with Oligohydramnios may require the implementation of facilities of routine antenatal care to all pregnant women, proper diagnosis and monitoring facilities and practice of standard protocol in management of Oligohydramnios in a centre having neonatal intensive care unit.

Materials and Methods

This prospective observational study was carried out in the Department of Obstetrics and Gynaecology, Combined Military Hospital, Dhaka from October 2012 to March 2013 of 60 admitted pregnant women having decreased amniotic fluid at third trimester among postdated pregnancy, pregnancy induced hypertension, prelabour rupture of membrane(PROM) and intrauterine growth retardation(IUGR). Pregnant women who had given written consent, willing to comply with the study procedure. Data were collected by faceto face interview and diagnosis was made on the basis of history clinical presentation and trans-abdominal ultrasonography. All the necessary information was collected in a pre-signed structured questionnaire and a check list. Fetal surveillance was done by foetal cardiotocography (CTG). Liquor was assessed (volume, colour) at the time of lower uterine caesarean section (LUCS) and vaginal delivery. Mode of delivery was recorded. Indication for LUCS was kept in the records. APGAR score was recorded at 1 & 5 minutes. Neonatal complications, such as respiratory distress syndrome, suspected sepsis, meconium aspiration syndrome and need for admission was recorded. Data were analyzed by SPSS version 20.0.

Results

Within the study period total 960 patients were admitted and 60 had oligohydramnios that is 6%. Multipara 37(62%) and nulipara 23(38%). There was no maternal mortality and morbidity. Liquor was meconium stained in 16 (27%). The study reflects that oligohydramnios has its affect only on fetal outcome but not on maternal health.

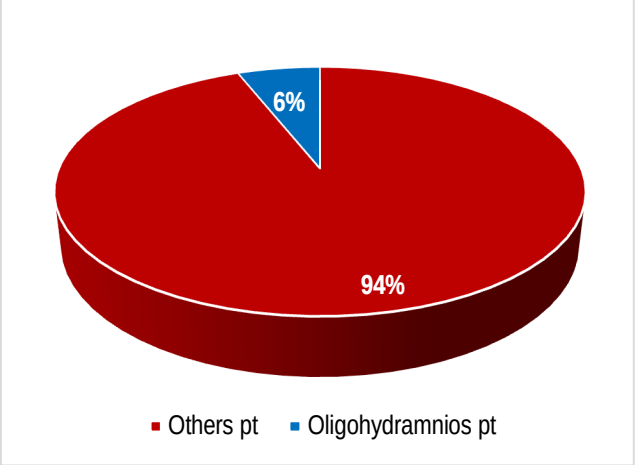

Figure-1: Distribution of incidence of oligohydramnios (n=60)

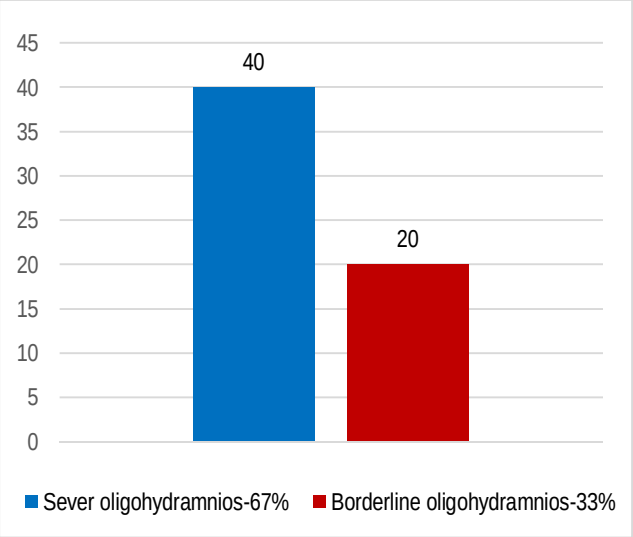

Figure-2: Distribution of types of Oligohydramnios (n=60)

Table-I: Distribution of risk factors associated with oligohydramnios (n=60)

Associated pregnancy complications	Number	Percentage (%)
Premature rupture of membrane(PROM)	10	17
Congenital anomalies of fetus & renal problem)	2	4
Postdated pregnancy	8	13
Placental in sufficiency (Hyper tension in pregnancy, Bronchial asthma)	8	13
Intra Uterine Growth Restriction (IUGR)	9	15
Without any apparent complications	23	38

Table–I show that 23(38%) patients did not have any suggestive cause for oligohydramnios. Common associations are PROM 10(17%), IUGR 9(15%), postdated pregnancy and placental insufficiency equally share 8(13%) each. Congenital anomalies are 2(4%) of patients.

Table-II: Distribution of mode of delivery (n=60)

Mode of delivery	Number of patient	Percentage (%)
Vaginal delivery	14	23.3
Caesarean delivery	46	76.7

Table-III: Distribution of patients according to indication of caesarean section (n=46)

Indication	Number of patient	Percentage
Fetal distress	28	61
H/O Previous caesarean section	12	26
Mal presentation	6	13

Among 46 C/S 28(61%) was due to fetal distress which seems to be very high in comparison to other indications of C/S.

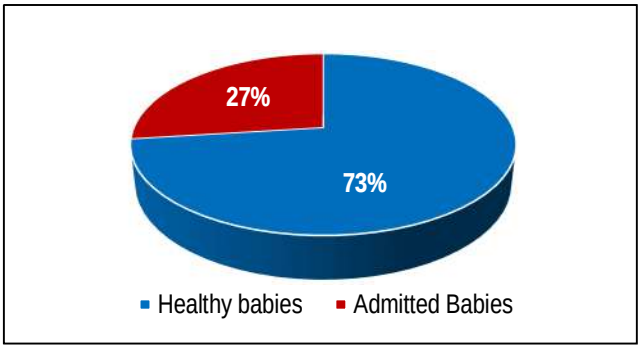

Figure-3: Distribution of admission in neonatal ward

Table-IV: Distribution of foetal outcome (n=60)

Disease	Number (%)	Conservative treatment Number (%)	Admission in NICU number (%)
No fetal morbidity	41(68%)		
Morbidity	19(32%)	3(5%)	16(27%)
-Birth asphyxia	12(20)	3(5%)	9(15%)
-Neonatal sepsis	2(3%)		2 (3%)
-Neonatal jaundice	2(3%)		2 (3%)
-Meconium aspiration syndrome	3(5%)		3 (5%)
Mortality- Early neonatal death- Stillbirth	Nil	Nil	Nil

Table-IV Shows 41(68%) having no fetal morbidity. Birth asphyxia 12(20%) is the main morbidity, meconium aspiration syndrome 3(5%), neonatal sepsis 2(3%), No fetal mortality.

Discussion

Decreased amniotic fluid volume noticed at any time especially during the third trimester is a stressful condition for the mother and family. In this study the place was chosen at CMH Dhaka, Obstetrics and Gynae Department. This is a tertiary level hospital and deals with routine and referred cases. This department has a specialized Obstetrics unit for these kinds of high risk pregnancies known as fetomaternal medicine unit. In this study most of the patients were selected from this specialized unit. In this period of 06 months study the percentage of admitted patients with decreased amniotic fluid was found 6%. In one study in BSMMU incidence was 8%[11]. In other studies it was 3% and 9%[12,13]. In this study the mean age of the patient was 24.02±3.7. There is a significant difference between primigravida and multigravida patients. Primigravida 38% and inmulti gravida 62% which is also observed in other studies Primi 46% and multi 54% and Primi 26% and multi 74%[11,13]. P value was <0.001 which was statistically significant.

Postdated Pregnancy is an established cause of oligohydramnios. It is found in 13% association in this study. Other causes found are PROM 17%, IUGR 15%, Placental insufficiency 13%, congenital anomaly 3%. Near about half of the patient 38% with decreased amniotic fluid revealed no apparent causative complications. A study showed PROM 20% and placental insufficiency 20% as the leading cause of oligohydramnios after the non-apparent cause 26%[11]. Another study revealed PROM (60%), IUGR (12%) and preeclampsia (6%) as the leading risk factors[14]. Two babies in this study with congenital anomaly reflected that majority of congenital anomalies associated with oligohydramnios involve the urinary tract anomaly. So it is observed that PROM is the leading apparent cause then comes placental insufficiency and postdate pregnancy equally.

Regarding mode of delivery this study found 77% caesarean section rate which is significantly high. Among them 61% was due to fetal distress. History of previous caesarean section 26% and malpresentation was 13% caesarean section rate was also high (64%) in other study[14]. Among 60 patients 16 (27%) patients had meconium stained liquor and it was not significant in others study[11]. Fourteen percent liquor was of meconium stained. Here 82% were delivered at 36-39 completed weeks, 13% were 40-42 completed weeks and 5% were delivered at 32-35 completed weeks.

In this study 78% babies were born with birth weight >2500gm. In one study birth weight <2500 gm was significantly high 66%. (14) In another study low birth weight babies were only 10%[15]. Present study reflects the scenario that with advancing gestational age growth of the fetus does not seems to be impaired except the cases of IUGR and placental insufficiency.

There was no neonatal death or still birth in this study. Neonatal admission was 16 among the 60 live births that is 27%. It was 50% in other studies[11,12]. Stillbirth was 8% in other two studies and none in one study respectively[11,13,12]. Early neonatal death was similar (0%)[12] and also dissimilar (10%) with other studies[11,16]. Respiratory distress were found among 13 (22%), of them 3 (5%) got well with only conservative management and primary resuscitation and 9 babies got admitted in neonatal ward. Three (5%) babies had suffered from meconium aspiration syndrome, 2(3%) had neonatal sepsis and 2(3%) had jaundice. In a study, respiratory distress syndrome was 10%, meconium aspiration syndrome was among

24%[10]. Small number of meconium aspiration syndrome in this study may be due to close fetal and maternal monitoring and early delivery by caesarean section. Facilities and improved care in intensive neonatal care units might be a cause of improved fetal survival. Normal vaginal delivery was relatively more among multigravida 8 out of 14 than primigravida, may be due to rapid progress of labour before developing fetal distress. In this study there was no maternal death or morbidity and not even any exaggeration of medical illness associated with oligohydramnios.

Conclusion

The incidence of decreased amniotic fluid is more among multigravida. Caesarean section deliveries were significantly higher. Indication of caesarean section was mainly due to fetal distress. Neonatal morbidity was significantly higher in severe oligohydramnios. Maternal mortality and morbidity does not affect significantly.

Creating a maternal registry of all hospital admitted patients with decreased amniotic fluid may give an accurate incidence and prevalence as well as to highlight the possible causes. Labour room facilities for ultrasonography (along with cardiotocography) for admitted patients is a must. Due importance should be given on followup of neonates for a long period to assess the outcome.

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