



## A Clinical Study on Maternal and Perinatal Outcome of Oligohydramnios

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### Abstract

**Background :** Oligohydramnios is one of the pregnancy associated common complications facing by obstetrician which is associated with adverse maternal and perinatal outcome such as birth defects, miscarriage, intrauterine growth restriction, still birth, preterm birth, increased operative interference etc.

**Objective:** To assess the impact of oligohydramnios on maternal and perinatal outcome.

**Methods:** This cross-sectional descriptive study was conducted at Department of Obstetrics and Gynecology, BSMMU, Dhaka from October 2017 to March 2018. Total 50 patients were enrolled by purposive sampling method according to the inclusion and exclusion criteria. Clinical evidence of oligohydramnios was looked for & confirmed by ultrasonography (USG). Based on Amniotic fluid index (AFI) measurements patients were divided into two groups. Those who have AFI < 5cm and 5-8cm. The significance of difference or comparison of means was measured by Chi square test. Maternal and perinatal outcome in pregnancies with oligohydramnios were compared with those with 5-8cm amniotic fluid volume.

**Results:** The mean age of the study population was 23.3±4.06 years and majority of the cases were multipara (56%) and presented at term (58%). Borderline oligohydramnios (AFI 5-8cm) was found in 74% cases and severe oligohydramnios (AFI < 5cm) were found in 26% cases. Most common etiological factor was idiopathic. Fifteen cases (30%) had vaginal delivery and caesarean section rate 70%, no maternal mortality occurred in this study, perinatal mortality rate was 10%, low birth weight baby was 63.6% and NICU admission rate was 53.8%.

**Conclusion:** An antepartum or intrapartum oligohydramnios is associated with significantly increased incidence of caesarean section for fetal distress and increased incidence of low-birth-weight babies and increased rate of neonatal complications.

**Key words:** Oligohydramnios, Maternal outcome, Fetal outcome, Amniotic fluid index.

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### Introduction

Oligohydramnios or reduced volume of amniotic fluid, particularly when it is diagnosed before term, is a great challenge to the obstetrician with regards to perinatal outcome. Although oligohydramnios is more common in third trimester, it can develop in any trimester. One to five percent of term pregnancies are complicated by this.<sup>1</sup>

The normal index of amniotic fluid (AFI) ranges from 8.1-20 cm. Oligohydramnios is defined as AFI less than 5 cm or 10th percentile for the gestational age or AFI less than or equal to 5 cm regardless of gestational age. AFI between 5.1-8

cm is known as Borderline Oligohydramnios.<sup>2</sup>

To allow normal fetal movement and growth and to cushion the fetus and umbilical cord, an adequate volume of amniotic fluid is necessary. Oligohydramnios inhibits these processes, especially when extreme, it can lead to fetal deformity, compression of the umbilical cord and death. The amount of amniotic fluid tends to be determined by a combination between fetal urine inflows and fetal swallowing outflows and intra-membranous water flow.<sup>3,4</sup> For the first two trimesters, the amniotic fluid accumulates and reaches a peak volume at 33 to 34 weeks.<sup>5</sup>

Diagnosis of Oligohydramnios is normally

performed by ultrasound measurement of the amniotic fluid compartment. A recent meta-analysis has shown that AFI <5 cm is associated with a substantial 2-fold increase in cesarean delivery rate for fetal distress and a 5-fold increase in APGAR score at 5 min below 7.<sup>5</sup>

In our country Obstetricians often faces a situation in which pregnant women is noted to have oligohydramnios both clinically and sonographically which is a predictor of adverse pregnancy outcome. But still limited number of proven studies about the perinatal outcome in patients with oligohydramnios is available here.

Therefore, this research was conducted to assess the impact of oligohydramnios on maternal and perinatal outcomes.

### Materials and Methods

From October 2017 to March 2018 this cross-sectional descriptive study was conducted at Bangabandhu Sheikh Mujib Medical University (BSMMU). Fifty patients who had oligohydramnios between 28 and 42 weeks of pregnancy participated in this study.

**Inclusion criteria :** 1. All cases admitted with oligohydramnios during the study period, 2. Age group between 18-40 years, 3. Pregnant women with gestational age between 28 to 42 weeks, 4. Singleton pregnancy.

**Exclusion criteria :** 1. Premature rupture of membrane (PROM), 2. Multiple gestation, 3. Intrauterine fetal death.

After selection of cases, detailed history was taken, and physical examination was done. Clinical evidence of oligohydramnios was looked for and confirmed by ultrasound examination. AFI was evaluated in these patients with technique of Phelan et al.<sup>2</sup> An AFI <5 cm considered as oligohydramnios and 5.1-8 cm considered borderline AFI. Fetal clinical outcome measured with APGAR score. Total score is 10, normal= 7-10, mild perinatal asphyxia= 4-6, severe perinatal asphyxia =0-3. In case of mild to severe perinatal asphyxia, baby must be transferred to neonatal unit rapidly for further management.<sup>6</sup> Previously selected maternal outcome variables during these pregnancies were recorded on pretested proformas. Perinatal outcomes which was occurred in these neonates also recorded.

All data were converted to tabulated forms to obtain statistical information by Using Microsoft Excel and SPSS 17 program. Mean values of different parameters were compared to see the differences between two groups by using Student's unpaired 't' test. Chi-square test was performed to find the statistical difference regarding gravida distribution between groups. For all statistical analysis, 'p' value <0.05 was considered as significant.

### Result

In our study we found that among 50 patients 74% (37) had borderline oligohydramnios and 26% (13) had severe oligohydramnios (Table I)

**Table I : Distribution of the patients according to their amniotic fluid index (n=50)**

AFI (cm)	No. of patients	Percentage (%)
<5 cm/ severe oligohydramnios	13	26
5-8 cm/ borderline oligohydramnios	37	74

Out of 50 cases Pre-term were 42% (21) and term were 58% (29)(Table II)

**Table II : Gestational age Distribution of the patients (n=50)**

Gestational age(weeks)	No. of cases	Percentage (%)
28-<37	21	42
>37-42	29	58

In our study 100% (13) of the patients who had AFI <5cm and 22(59.5%) who had AFI 5-7 cm underwent Caesarean section (C/S). Only 15(40.5 %) had vaginal delivery. The difference was statistically significant ( $p<0.05$ ). (Table III)

**Table III : Distributions of the study patients according to mode of delivery (n=50)**

Mode of delivery	AFI<5cm		AFI 5-8 cm		P value
	No	Percentage	No	Percentage	
Vaginal delivery	0	0 %	15	40.5 %	0.001 (s)
Caesarean section	13	100 %	22	59.5 %	

In this study more than half of study population (54.6%) underwent caesarean section due to fetal distress in patients with AFI<5cm and 36.3% with AFI 5-8cm. Only fetal distress was statistically significant ( $p<0.05$ ) but other variables were not statistically significant ( $p>0.05$ ) regarding the indications of C/S(Table IV)

**Table IV : Distribution of the study patients according to indications of caesarean section (n=35)**

Indication of C/S	AFI<5cm (n=13)		AFI 5-8cm(n=22)		P value
	No	Percentage	No	Percentage	
Fetal distress	7	54.6%	8	36.3 %	0.017(s)
Malpresentation	1	7.5 %	4	18.7%	0.762(ns)
IUGR	2	15.2 %	3	13.5 %	0.641(ns)
Severe Preeclampsia	2	15.2%	2	9.0 %	0.162(ns)
Failed induction	0	0 %	3	13.5 %	0.264 (ns)
Bad obstetric history	1	7.5 %	2	9.0 %	0.162 (ns)

In our study most of patient recovery was uneventful 82% (29) and only 17.1% (6) patient had different types of complications like surgical site infections(SSI), postpartum hemorrhage (PPH), puerperal pyrexia (Fig. 1)

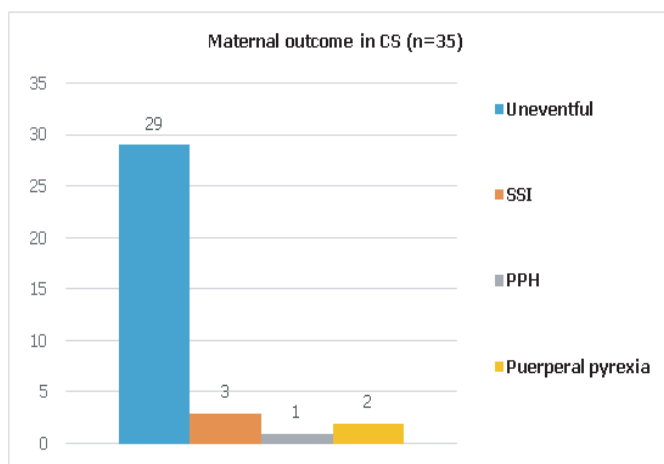


Fig-1: Maternal outcome in caesarean section (n=35)

In this study the fetal outcome of 48 cases taking APGAR score at 1 minute and 5 minutes, the score of <7 at 1 minute was found in 37.5% (18) of cases and the score of <7 at 5 minutes was found in 41.7% (20) of cases. There were 2 cases of fresh still birth in this study (Fig 2)

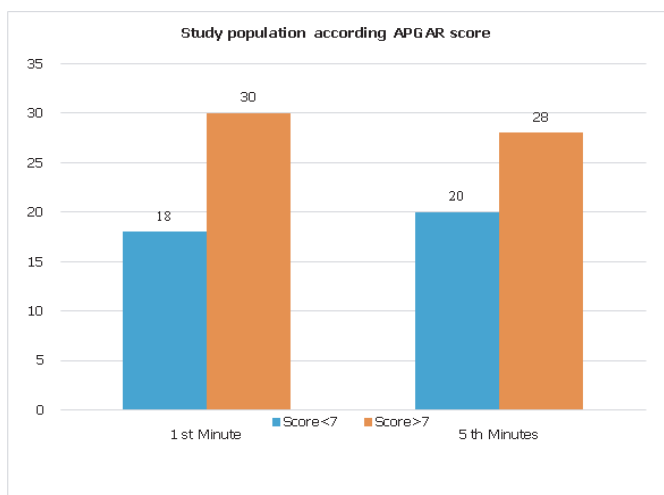


Fig 2 : distribution of study population according to APGAR score (n=48)

In our study we found that 53.8% (7) cases with AFI <5cm and 35.1% (13) cases with AFI 5-8cm were admitted to NICU which was statistically significant ( $p < 0.05$ ) between two groups (Table V)

Table V : Distribution of the study patients according to fetal outcome (n=50)

Foetal Outcome	AFI<5cm		AFI 5-8 cm		P value
	No	Percentage	No	Percentage	
NICU admission	7	53.8 %	13	35.1 %	0.006 (s)
Healthy baby	1	7.7 %	13	64.9 %	0.001 (s)
Perinatal death	3	23.1 %	00	0.0 %	0.081 (ns)
Still born	2	15.4 %	00	0.0 %	0.076 (ns)

In this study we found that Respiratory distress, Meconium aspiration and healthy baby was statistically significant ( $p < 0.05$ ) between two groups (Table VI)

Table VI : Distribution of the study patients according to neonatal complications (n=50)

Neonatal Complications	AFI<5cm		AFI 5-8 cm		P value
	No	Percentage	No	Percentage	
Respiratory distress	5	38.4 %	8	21.6 %	0.004 (s)
Meconium aspiration	2	15.4 %	7	18.9 %	0.002(s)
Perinatal death	3	23.1 %	00	00 %	0.081 (ns)
Still born	2	15.4 %	00	00%	0.076 (ns)
No complications	1	7.7 %	24	64.9 %	0.001 (s)

Discussion

During pregnancy, the amniotic fluid that covers the fetus plays many functions. It creates physical space for musculoskeletal growth, promotes normal fetal lung development, and helps to prevent umbilical cord compression.<sup>7</sup> Ultrasonography is the best way to detect oligohydramnios early, as well as other related conditions.

In this current study it was observed that women with AFI<5 cm was about 26% and 5-7 cm in 74% of cases. We also found that 29 cases (58%) out of 50 were diagnosed as oligohydramnios at term between 38-40 weeks of gestation and 21 cases(42%) were diagnosed < 37 weeks of gestation. Melamed et al showed 26.9% of the patients had gestational age <37 weeks.<sup>8</sup> On the other hand, Shanks et al. showed the mean gestational age 34.38+3.04 weeks, which is comparable with the current study.<sup>9</sup>

Caesarean section rate was high in cases of AFI <5 cm due to fetal distress (54.6%) which was statistically significant ( $p < .05$ ). Other indications of caesarean section like malpresentation, IUGR, Severe Preeclampsia, failed induction, Bad obstetric history etc was not statistically significant. Similarly, in severe oligohydramnios, Melamed et al. and Jandial et al. found that the caesarean section was significantly ( $p < 0.05$ ) higher, which are closely similar to the current study<sup>10,11</sup>.

Among 35 mothers 29(82.8%) had uneventful postoperative period, whereas others 6(17.1%) had postoperative complications like surgical site infection 03(8.6%), postpartum haemorrhage 01(2.9%) and puerperal pyrexia.

Adverse perinatal outcome like low birth weight were seen in 7cases, low APGAR score of <7 at 1minute and 5<sup>th</sup> minute were 18 cases (37.5%) and 20 cases (41.7%) respectively, NICU admission was 7(53.8%) cases in patient with AFI<5 cm for various reasons like respiratory distress, meconium aspiration syndrome, IUGR, low birth weight etc. Compared to the research conducted by Jun Zhang et al perinatal outcome of oligohydramnios-associated pregnancies, it is shown that isolated oligohydramnios is associated with good birth weight (mean wt-2.4 kg), APGAR score, decreased NICU admission rate and decreased perinatal mortality.<sup>11</sup>

## Conclusion

Now a day's oligohydramnios poses a challenge in obstetric management particularly when diagnosed before term. Although cause of oligohydramnios is unknown in most cases, amniotic fluid volume is a predictor of fetal tolerance of stress in labour. Reduced amniotic fluid volume is frequently associated with Preeclampsia, Intrauterine growth restriction, increased operative interference for fetal distress in labour. Low APGAR score at birth, perinatal death, still birth and higher NICU admission rate are higher in severe oligohydramnios cases.

## Limitations of the study

The access to tertiary level hospital is low in case of all women of different socioeconomic status especially for poor even with high risks. Therefore, sample size is relatively small, and duration is short in this study.

**Conflict of interest :** None.

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