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Original Article

To Compare the Frequency of Adverse Outcomes of Severe Versus Mild Oligohydramnios at Full Term

Abeerah Zafar,[1] Kamran Shauket,[1] Nida Fatima,[2] Sibghat Abbas,[3] Mehwish Nawaz,[4] Samia Shahbaz[5]

[1]Sahiwal Teaching Hospital Sahiwal, [2]BHU Kalri Chiniot, [3]THQ Hospital Bhowana Chiniot, [4]Mayo Hospital Lahore, [5]Shalamar Medical & Dental College, Lahore

Abstract

Objective: Oligohydramnios is a disorder that occurs in pregnancy and is characterized by an amniotic fluid deficiency. To determine the frequency of severe oligohydramnios in pregnant females at term presenting diagnosis of oligohydramnios and to compare the frequency of adverse outcomes of severe versus mild oligohydramnios at term.

Methods: The Descriptive case series was held in Department of Obstetrics and Gynecology, CMH, Okara for 06 months i.e. from 28-12-2019 to 29-6-2020. Keeping in view the inclusion criteria, 100 pregnant females were enrolled. Then females underwent ultrasound and level of AFI was noted. If AFI<5cm, then severe oligohydramnios were labeled and females were divided in two groups i.e. mild oligohydramnios and severe oligohydramnios. Females were followed up till delivery and adverse outcomes were noted.

Results: The mean age group of females was 27.39±3.4 years. The severe oligohydramnios was found in 50 (50%) patients. When were compare the adverse outcome with oligohydramnios we found that the C-section [mild oligohydramnios =26 (52%) & in severe oligohydramnios =33(66%) females], perinatal death [mild oligohydramnios =3(6%) & in severe oligohydramnios=6(12%) females], low Apgar score in [mild oligohydramnios =26(52%) & in severe oligohydramnios=33(66%) females], similarly the low birth weight [mild oligohydramnios =1(2%) & in severe oligohydramnios=2(4%) females]. The adverse outcome showed statistically insignificant difference i.e. p-value>0.05.

Conclusion: About half oligohydramnios patients had severe oligohydramnios, while there is no significant association of mild or severe oligohydramnios with adverse feto-maternal outcome.

Keywords: Oligohydramnios, Adverse Outcome, Mild, Severe, amniotic fluid index

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Corresponding Author: Dr. Abeerah Zafar **Email:** bluestrawberry_2@live.com

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Introduction

Amniotic fluid is defined as clear, pale yellowish white fluid which covers the fetus encompassed within the amniotic sac during pregnancy. For normal fetal development, it provides a supportive environment throughout gestation. It guards the fetus from any stress and infection through its cushioning and bacteriostatic nature. It prevents the compression of the umbilical cord and placenta and protects the fetus from vascular and nutritional consession.[1]

Adequate amount of fluid levels manifest proper growth of the developing fetus, while insufficient levels may be linked with incomplete lung maturation and poor fetal growth. AFI has been known to play a vital role in obstetric outcome.[2] Oligohydramnios is defined as reduced amniotic fluid volume according to gestational age. Semi quantitatively it is defined as using the AFI which is measured, by adding the depth in centimeters of, one of the largest vertical pocket in each of four equal uterine quadrants of uterus.

AFI ≤5 cm is described as oligohydramnios. A borderline amniotic fluid has been defined as an AFI of 5.1 cm to 8 cm.[3] The incidence of an amniotic fluid index of 5-8cm than normal AFI in different studies varied from 7% to 45%, with in general terms of 12%.[4]

Effect of oligohydramnios on fetal and maternal outcome can be significant. It can cause fetal complications e.g. cord compression, fetal pulmonary hypoplasia, fetal

growth retardation, low Apgar score, need for Neonatal Intensive Care Unit admission and fetal morbidity and mortality. Maternal complications like prolonged labour and increased incidence of operative vaginal delivery can occur.[5] One study found that the frequency of severe oligohydramnios was 35% while mild oligohydramnios was 65% among females with reduced AFI.[6]

Another study found that 64.2% females had severe oligohydramnios while 35.8% had mild oligohydramnios. Cesarean section occurred in 51.5% cases with severe oligohydramnios while in 54% with mild oligohydramnios ($p>0.05$). Low Apgar occurred in 21.4% vs. 3.2% ($p<0.05$), small for gestational age in 35% vs. 23.8 ($p>0.05$) while perinatal death occurred 38.8% vs. 3.2% ($p<0.05$), correspondingly.[2]

Hypothesis of this study is to find the frequency of severe oligohydramnios and to compare it with the adverse outcome at term. This study will be done to assess whether severe oligohydramnios cause more adverse outcome than mild oligohydramnios or there is no difference, as varied results has been found as stated above. This study is being conducted to this controversy and no such study has been done before in our Pakistani population. Results of international studies cannot be generalized in our population. This encouraged us to conduct this study find the adverse outcome with more severe oligohydramnios in local setting among pregnant women to get local evidence. Results of this study will pave the way to plan proactive approach in dealing such pregnancies in future. So, the aims of present study are to determine the frequency of severe oligohydramnios in pregnant females at term presenting diagnosis of oligohydramnios and to compare the frequency of adverse outcomes of severe versus mild oligohydramnios at term.

Methods

The Descriptive case series was managed in the Department of Obstetrics and Gynecology, CMH, Okara for 06 months i.e. from 28-12-2019 to 29-6-2020. The Sample size of 100 cases is intended with 95% Confidence level, with 9.5% margin of error and calculating proposed percentage of severe oligohydramnios i.e. 35%[6] in pregnant women. Women age 18-40 years, parity 0-4, presenting between 37 and 42 weeks (on LMP) with singleton pregnancy on ultrasound, diagnosed with oligohydramnios were taken with non-probability consecutive sampling. Abnormal placental presentation on ultrasound (accrete, percreta, increta, previa, abruption), Premature rupture of membrane (vaginal washing fluid results urea level ≥ 0.41 mg/dl), previous cesarean section, gestational or chronic hypertension (BP≥140/90mmHg), diabetes (BSR>200mg/dl).An amniotic fluid index of <8.0 cm on ultrasound was taken as oligohydramnios and Mild oligohydramnios as 5.1-8 cm on ultrasound and Severe oligohydramnios ≤5.0 cm on ultrasound at gestational age >37 weeks (on LMP). Adverse outcomes were measured as Cesarean section: if delivery occurred through incision in lower abdomen under spinal anesthesia due to fetal distress assessed by abnormal CTG, meconium stained liquor or failure to progress. Perinatal death if death of fetus occurred in womb, during labor or within 7 days of birth. At birth Low Apgar score if Apgar score <7 within 5 minutes of birth. Small for gestational age is termed as if baby weight is ≤ 10th percentile according to gestational age of birth.

100 women fulfilling the inclusion criteria from Department of Obstetrics and Gynecology, CMH, Okara were incorporated in this study. Informed consent was taken before the study started. Demographics (age, gestational age, parity, BMI, AFI index) was also taken.

Then females underwent ultrasound and level of AFI was noted. If AFI<5cm, then severe oligohydramnios were labeled and females were divided in two groups i.e. mild oligohydramnios and severe oligohydramnios. Then females were followed-up till delivery. Mode of delivery was noted and if delivery occurred through cesarean section, then it was noted.

If Apgar score after 5 minutes of birth was <7, then low Apgar score was labeled (as per operational definition). Birth weight was noted and if baby have weight <10th percentile for particular gestational age, then small for gestational age was labeled.

If death of fetus inside womb, at delivery or within 7 days of delivery occurred, then perinatal death was labeled (as per operational definition). All this information was recorded on preformas (attached). All patients with oligohydmnios were managed efficiently as per standard protocol. Data was entered and observed with statistical analysis program (IBM-SPSS version 22). Mean & standard deviation was preconceived regarding age, gestational age, BMI and AFI. Frequency and percentage was computed for Oligohydramnios (mild/severe), cesarean section, perinatal death, Low Apgar score and small for gestational age.

The Chi square test was put in for comparison of adverse outcomes in females with mild and severe oligohydramnios taking $p \leq 0.05$ as significant. Effective modifiers e.g. age of the patient, gestational age of the patient, BMI and parity were checked by stratification. Post stratification, Chi square test was put in to compare adverse outcomes in females with mild and severe oligohydramnios in each strata taking $p \leq 0.05$ as significant.

Results

In this study total 100 females were enrolled. The mean age of the females was 27.39±3.39 years with minimum

and maximum ages of 19 & 35 years respectively. In mild oligohydramnios group the mean age of the females was 38.00±0.73 years while in severe oligohydramnios group the mean age of the females was 38.52±1.04 years. Table 1

In mild oligohydramnios group the mean gestational age of the females was 38.12±4.85 weeks while in severe oligohydramnios group the mean gestational age of the females was 38.53±1.04 weeks.

In mild oligohydramnios group the mean AFI index of the females was 6.54±0.97 cm while in severe oligohydramnios group the mean AFI index of the females was 3.50±0.86 cm. This difference was statistically significant. i.e. p-value=<0.001. Table 2

In mild oligohydramnios group the lower APGRA score was found in 26(52%) females and in severe oligohydramnios group the lower APGRA score was found in 33(66%) females. This difference was statistically insignificant. I.e. p-value=0.155. In mild oligohydramnios group the perinatal death occurred in 3(6%) females and in severe oligohydramnios group the perinatal death occurred in 6(12%) females. This difference was statistically insignificant. i.e. p-value=0.487. According to this study low birth weight was found in 3(3%) females.

In mild oligohydramnios group the low birth weight was found in 1(2%) females and in severe oligohydramnios group the low birth weight was found in 2(4%) females. This difference was statistically insignificant. i.e. p-value=1.000. Table 3

Table 1: *Descriptive statistics of age (years) between study groups*

		Study Groups	
		Mild	**Severe**
Age (years)	n	50	50
	Mean	38.00	38.52
	Standard Deviation	0.73	1.04
	Minimum	19	21
	Maximum	34	35

Table 2: *Comparison of AFI index between study groups*

		Study Groups		p-value
		Mild	**Severe**	
AFI index (cm)	n	50	50	<0.001
	Mean	6.54	3.50	
	Standard Deviation	0.97	0.86	

Table 3: *Comparison of adverse outcomes between study groups*

		Study Groups		Total	p-value
		Mild	**Severe**		
Low Apgar score	Yes	26	33	59	0.155
		52.0%	66.0%	59.0%	
	No	24	17	41	
		48.0%	34.0%	41.0%	
Perinatal deaths	Yes	3	6	9	0.487
		6.0%	12.0%	9.0%	
	No	47	44	91	
		94.0%	88.0%	91.0%	
Low Birth Weight	Yes	1	2	3	1.000
		2.0%	4.0%	3.0%	
	No	49	48	97	
		98.0%	96.0%	97.0%	
Total		50	50	100	
		100.0%	100.0%	100.0%	

Fig 1: *Frequency Distribution of Low Birth Weight*

Discussion

Amniotic fluid is defined as fluid that surrounds the baby and protects them in the uterine cavity. It is first made up of water from the mother, but after 20 weeks it is made from fetal urine. Oligohydramnios is labeled when the amniotic fluid is low around the fetus. Around 4% of pregnant women are diagnosed with oligohydramnios. Fetus is being protected by adequate amount of amniotic fluid that surrounded by the baby. Amniotic fluid protects the fetus and provides essential micronutrients to the developing fetus that help it in maturation, growth and development, and provides fetus with a consistent favorable environment for the adequate intrauterine growth of the baby[7].

A study conducted by Vidyadhar B.Bangal et al shows that the mean age of the females was 27.39±3.39 years. According to the result of that study 78% of cases were

in the age group 20 to 29 years, as compared to the other age groups, showing the child bearing age of most of the women with the mean maternal age of 22.8 ± 4.2 years of age. NO of studies conducted by Chauhan et al.[8] Jun Zhang et al.,[9] & Everett et al.,[10] shows that the mean maternal age were 23.6 ± 6.5 years, 28.4 ± 3.4 years and 23.8 ± 5.7 years respectively.

In this study oligohydramnios patients 50% were appeared with severe and 50% appeared with mild oligohydramnios. In mild oligohydramnios group the cesarean section was done in 26(52%) females and in severe oligohydramnios group the c section was done in 33(66%) females and the difference was analytically insignificant. i.e. p-value>0.05

One study found that the frequency of severe oligohydramnios was 35% while mild oligohydramnios was 65% among females with reduced AFI.[6] Another study found that 64.2% females had severe oligohydramnios while 35.8% had mild oligohydramnios.

Oligohydramnios affects 0.5% to 8% of pregnancies, its management and outcome depends upon gestation age and related obstetric complications. Outcomes are worse with early gestation or more severe oligohydramnios (e.g., anhydramnios).[11]

A study by Vidyadhar B. Bangal et al[68] presented that prolonged pregnancy, pregnancy induced hypertension and fetal congenital malformations were on of the commonest complications encountered with oligohydramnios. Forty four percent cases were delivered through caesarean section. Overall perinatal mortality was 24% recorded. Cases with severe oligohydramnios and anhydramnios were associated with intrapartum fetal heart rate abnormalities, (16%) low Apgar score and (8%) fetal meconium aspiration syndrome. Cesarean section occurred in 51.5% cases with severe oligohydramnios while in 54% with mild oligohydramnios (p>0.05).[2]

Study that was conducted by Casey B et al.[12] shows that, there was increase in no of induction of labour (42%) and Cesarean section deliveries (32%) in cases of oligohydramnios . Jun Zhang ET al.[9] reported that, the cesarean section delivery rates were similar between women with oligohydramnios and the control group (24% vs. 19%). Golan a ET. Al.[13] et al study shows that, the cesarean section was performed in 35.2% of pregnancies.

Our study shoes that, in mild oligohydramnios group the lower APGRA score was found in 26(52%) females and in severe oligohydramnios group the lower Apgar score was found in 33(66%) females. We found no significant difference between the oligohydramnios (Mild & severe) with lower Apgar score p-value> 0.05.

Study being conducted by Casey B et. al. shows 12(6%) babies with Apgar score of less than 3 at 5 minute. Out of those nine newborns, seven were died during neonatal period. Jun Zhang et al.,[9] narrated that an Apgar score of <7 at 1 minute was present in fifteen Six babies had Apgar score of <7 at 5 minute. Desai et al.[14] reports that the three newborns with Apgar score less than 7 at 5 minute as against only one in control group. In an identical study conducted by Locatelli et al.,[17] of 341 patients suffering oligohydramnios, concluded no purposeful difference for Apgar score of less than 7 at 5 minute in study and control group. According to a study ,result shows Low Apgar occurred in 21.4% vs. 3.2% (p<0.05), small for gestational age in 35% vs. 23.8 (p>0.05).[2]

In mild oligohydramnios group the perinatal death occurred in 3(6%) females and in severe oligohydramnios group the perinatal death occurred in 6(12%) females (p-value>0.05). Few studies are discussed below showing their results in favor of our study as.

Study conducted by Chhabra et al.,[18] shows a very high (87.7%) perinatal mortality in their study conducted for oligohydramnios. Wolff et al.,[15] study shows that the perinatal mortality in their study was 7.2%. Apel-Sarid et al.,[16] quoted that the perinatal mortality was 9.9%. study conducted by Chamberlin et al.,[17] quoted that the gross and corrected perinatal mortality rate in pregnant ladies with reduced amount of amniotic fluid found it to be 188/1000 and 109/1000 respectively. Overall, the perinatal mortality is high in patients diagnosed by oligohydramnios. According to one more study perinatal death occurred 38.8% vs. 3.2% (p<0.05).[2]

Conclusion

According to this study approximately half of the pregnant patients diagnosed with oligohydramnios present with severe oligohydramnios, and the comparison of mild and severe oligohydramnios with adverse outcome showed no association however in severe oligohydramnios the adverse outcome were higher.

Conflict of Interest *None*

Funding Source *None*

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