

Pregnancy Outcome among Patients with Oligohydramnios and Suggested Plan of Action

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Abstract:

Background: Oligohydramnios is a threatening condition to maternal and fetal health. It is a clinical condition characterized by amniotic fluid index (AFI) of ≤ 5 cm or less by sonographic assessment. The **aim of this study** was to compare the maternal and fetal outcome in parturient women with oligohydramnios versus others with normal amniotic fluid, and to suggest plan of action in management of oligohydramnios women. A **prospective, descriptive study** was conducted at the labor ward of Maternity and Childhood Hospital at Zagazig University Hospitals during the period between 1/2/2014 and 30/8/2014. The study comprised a **purposive sample** of 200 parturient women regardless of age, parity or labor condition. Women were assigned to 100 women suffered from oligohydramnios and 100 women with normal amniotic fluid index. **The tools** used for data collection were; a structured interview sheet, maternal assessment sheet, Partogram, and neonatal assessment record. **The results** of the present study revealed that the rate of CS was significantly higher in oligohydramnios group compared to the control group (42.0% vs. 20.0% respectively). There was statistically significant increasing in FHR decelerations, thick meconium, low Apgar score at 5 min, admission to NICU, and an increased rate of congenital anomalies & IUGR in the oligohydramnios group. **It can be concluded that** an amniotic fluid index of ≤ 5 cm detected after 37 completed weeks of gestation is an indicator of poor perinatal outcome. **It is recommended that;** determination of AFI through regular antenatal care visits can be used as an adjunct to other fetal surveillance methods to identify those infants at risk of poor perinatal outcome.

Keywords: Amniotic Fluid Index; Oligohydramnios; Perinatal Outcome; Apgar Score; Cesarean Section.

I. Introduction:

The amniotic fluid (AF) is a part of the baby's life support system. It aids in the development of muscles, limbs, lungs and digestive system. Amniotic fluid is produced soon after the amniotic sac is formed at about 12 days after conception. It is first made up of effusion that is provided by the mother's circulation and then around the 20th weeks fetal urine becomes the primary substance. As the baby grows he or she will move and tumble in the womb with the help of the amniotic fluid. In the second trimester the baby will begin to breathe and swallow the AF. In some cases the AF may measure too low or too high. If the measurement of AF is too low it is called oligohydramnios. If the measurement of AF is too high it is called polyhydramnios. (9)

Oligohydramnios is the condition of having too little AF. It is defined as AF index is less than 5 centimeters (or less than the 5th percentile). (10) Defined the diagnosis of oligohydramnios as the absence of a fluid pocket 2-3 cm in depth, or a fluid volume of less than 500mL at 32-36 weeks gestation.

About 8% of pregnant women can have low levels of amniotic fluid, with about 4% being diagnosed with oligohydramnios. It can occur at any time during pregnancy, but it is most common during the last trimester. If a woman is passed her date by two weeks or more, she may be at risk for low amniotic fluid levels since fluids can decrease by half once she reaches 42 weeks gestation. Oligohydramnios can complicate 12% of pregnancies that go past 41 weeks. (4)

The common clinical features are smaller symphysis fundal height, fetal mal-presentation, undue prominence of the fetal parts and reduced amount of AF. Usually the degree of Oligohydramnios is proportional to the severity of placental hypo perfusion and IUGR (Intra Uterine Growth Restriction). The most likely cause of oligohydramnios in IUGR babies is decreased urine output. (25)

Complications may include cord compression, musculoskeletal abnormalities such as facial distortion and clubfoot, pulmonary hypoplasia and intrauterine growth restriction. Amnion nodosum is also frequently present (nodules on the fetal surface of the amnion). Even a moderate reduction in AFV is associated with abnormal FHR, meconium stained liquor which often requires CS and may result in perinatal

morbidity and/or mortality. (17) Moreover,

Casey et al., (5) mentioned that oligohydramnios is associated with a significant increased risk of cesarean delivery for fetal distress, a low Apgar score at 5 min and neonatal acidosis.

The maternity- child health nurse has a vital role in continuous antepartum and intrapartum monitoring for every women diagnosed with oligohydramnios to prevent further maternal and fetal complications and/or risks associated with oligohydramnios. Nursing studies point to the importance of maintaining adequate hydration during exercise, thermal exposure or gastrointestinal losses in pregnancy as it would be of even more importance for women with pregnancies at risk of uteroplacental insufficiencies, because inadequate fluid intake may cause oligohydramnios and further fetal compromise. The nurse should provide more awareness for pregnant women about the importance of adequate fluid intake during pregnancy. (24)

Also the use of antihistamines has played a role in the decrease in the amniotic fluid. Women should be urged to increase their fluid intake if using this type of medications. And should be encouraged to rest as much as possible in the lateral recumbent position, because this should optimize uteroplacental perfusion. (31)

Significance of the study:

Few studies have examined maternal and fetal complications and outcome associated with oligohydramnios in Zagazig. During the work at Maternity Hospital at Zagazig University Hospitals, the researcher noticed an increase in the incidence of oligohydramnios and associated fetal complication. Therefore, this study was carried out to investigate maternal and neonatal outcomes in women with oligohydramnios. And would pay the researcher attention to develop a plan of action for management of those oligohydramnios women in the next risk, and new oligohydramnios ones, that provide the greatest chance for appropriate safe delivery with the least maternal, fetal and neonatal risk.

Aim of the study:

The aim of the current study was to assess the impact of oligohydramnios on maternal and fetal outcome. And to suggest plan of action for management of oligohydramnios women.

Research questions:

The present study was attempting to answer the following questions:

1. Is oligohydramnios a marker for fetal compromise?
2. Does it affect pregnancy outcome?
3. What is the suggested plan of action?

Research hypothesis:

1. Oligohydramnios has an effect on fetal and maternal outcomes.
2. There is a plan of action to manage oligohydramnios women.

Subjects and methods: Research design:

A prospective -descriptive study design was adopted in this study to achieve the stated aim.

Research setting:

The study was conducted at the Maternity Hospital - Zagazig University Hospitals during the period between 1/2/2014 and 30/8/2014.

Sample:

The study comprised a purposive sample of 200 parturient women. They were selected from the aforementioned setting according to the following inclusion criteria:

Inclusion criteria:

- 1- Weeks of gestation range between 36-40 weeks.
- 2- Amniotic fluid index \leq 5.0 cm for the women with oligohydramnios and women with normal amniotic index.
- 3- Reactive non stress test and biophysical profile points on admission not less than 8.
- 4- Singleton cephalic fetus.
- 5- No gross fetal anomalies.
- 6- No premature rupture of membranes.
- 7- Abruptio placenta and placenta previa.

The study subjects were divided into two equal groups of 100 parturient each as follows:

Group I (study group): diagnosed with oligohydramnios

Group II (control group): had normal amniotic fluid index

Tools of Data Collection:

Data collection was done through the use of the following tools:

A. Structured Interview Questionnaire): Included the following parts:

- a. **Socio demographical data**, such as name, age, education and occupation.
- b. **Obstetrical history**, such as parity, number of previous abortion, spacing between deliveries and types of previous deliveries, number of living children, previous history of oligohydramnios or congenital abnormalities of the newborn.
- c. **Current labor data;** it included data about phase of admission to labor room, membrane's condition , amniotic fluid condition, feeling of fetal movement, weeks of gestation by ultrasound and leakage of fluid from vagina.

B. Maternal assessment sheet upon admission to labor room: it included the following:

1- General examination, such as maternal vital signs, auscultation of FHR.

2- Abdominal examination and pelvic examination to obtain fundal level, fundal grip, umbilical grip and pelvic grip. Furthermore; to determine signs of progress of labor and Bishop score.

3- CTG: for evaluation of the uterine contractions and fetal heart rate.

4- Laboratory investigations: such as blood analysis to determine level of hemoglobin, RH, red blood cell countetc

5- Ultrasonography: for estimation of fetal gestational age, amniotic fluid index (AFI), amniotic fluid volume and color, fetal viability and presence of gross fetal anomalies.

C. Partogram:

- a. To assess maternal and fetal condition during the first stage of labor, mode of delivery, complications encountered during labor

D. Neonatal assessment record:

Apgar score at the first and fifth minute, neonatal weight, (NICU), neonatal complications, deformities or mortality.

Pilot study:

A pilot study was carried out on 20 parturient women (who were excluded from the sample) to assess the clarity and applicability of the data collection tools, arrangements of items, estimate the time needed for each sheet and the feasibility of the study and acceptance to be involved in the study. Necessary modifications were undertaken.

Field study:

Collection of data covered "from the first of February 2014 to the end of August 2014". After getting the official permission, the pilot testing of the study tools was done and analyzed. The researcher attended labor ward the three hot days per week during morning and afternoon shifts. She filled the interviewing questionnaire sheet individually, after explaining the purpose of the study. Each interview took about

5-15 minutes. General, abdominal and vaginal examinations were done by the on duty physician, assisted with the researcher.

Administrative and ethical considerations:

An official letter was sent from Zagazig Faculty of Nursing to the director of the maternity hospital at Zagazig University Hospital to obtain an official approval for collection of data. All ethical issues were taken into consideration during all phases of the study: the researcher maintained an anonymity and confidentiality of the subjects. The inclusion in the study was totally voluntary. The aim of the study was explained to every woman before participation, and a written consent was taken from each woman . Women were notified that they can withdraw at any stage of the research; also they assured that the information obtained

during the study will be confidential and used for the research purpose only.

II. Statistical design:

After data collection it was revised, coded and fed to statistical software IBM SPSS version 20. The given graphs were constructed using Microsoft excel software. All statistical analysis was done using two tailed tests and alpha error of 0.05. P value less than or equal to 0.05 was considered to be statistically significant. For all statistical tests done, the threshold of significance was fixed at the 5% level (p- value). A p-value > 0.05 indicates non significant result and the p-value < 0.05 indicates a significant results and the p- value is the degree of significance. The smaller the p-value obtained, the more significant is the result, the p-value being the probability of error of the conclusion.

III. Results:

Table 1 presents the number and percent distribution of the studied women according to their obstetric data. As shown in table 1 the highest percentage of women in the oligohydramnios (58.0%) and control (52.0%) had one to three para. It is also evident that women in the oligohydramnios group were significantly (P=0.002*) less likely to have lower mean weeks of gestation compared to those in the control group (38.9 ±1.3 vs.

39.4 ± 0.9 respectively). Concerning feeling of leakage of fluid from vagina, both groups were quite alike, with no statistical significant difference. In most of cases, these fluids were vaginal secretions or discharges, not true liquor leakage. Meanwhile, 7 (7.0%) women in the study group had previous history of oligohydramnios compared to one in the control group. Differences observed was statically significant ($X^2=4.7$, P=0.030*!).

Table 2 reveals distribution of the studied women according to assessment findings upon admission to labor room. Women in the oligohydramnios group were significantly (P=0.000*^) more likely to attend labor room during their latent phase of the first stage of labor compared to those who had normal AFI (29.0% vs. 2.0% respectively). The same table points to statistical significant differences between the two groups as regards to fetal heart rate (P=0.020*^). It is evident that women in the study group were significantly less likely to have a normal fetal heart rate (110-160 b/m) compared to women in the control group (36.0% vs. 58.0% respectively). Meanwhile, abnormal fetal heart rate" variable deceleration, beat to beat variability and bradycardia" were more pronounced among women in the study group than those in the control group (52.0%, 7.0% & 4.0 vs. 34.0%, 3% & 5.0 respectively).

A comparison of Ultrasonographic findings between the two studied groups, on admission to labor room is illustrated in **table 3**. The entire study group had abnormal AFI, of those more than half (54.0%) had An AFI that ranged between 0-2, while, 46.0% had an AFI 3-5. Meanwhile, its volume was below average in 46.0% and markedly reduced in 54.0% of the study group. As for the color of AF, it was clear in 77.0%, and turbid in 22.0% of the study group compared to those in the control group (93.0% & 6.0% respectively). The incidence of congenital abnormalities was only 2.0% among the study group. Differences observed are statistically significant (P=0.000*) regarding amniotic fluid volume and amniotic fluid index.

Table 4 points to statistical significant difference between the two groups as regards to their admission phase to labor room ($X^2=27.8$, P=0.000*). Concerning labor progress and uterine contraction during the active phase of the first stage of labor, both groups were quite alike with no statistical significant differences.

Table 5 compares second and third stages outcome of labor among the two groups. Women with oligohydramnios and normal AFI had revealed statistical significant difference in the mode of delivery ($X^2=11.3$, P=0.001*). As evident from this table, the rate of spontaneous

vaginal delivery was higher in the control group (80.0%), compared to the study group (58.0%). As regards the delivery of the placenta, it was separated by active management in two thirds (62%) of women who had oligohydramnios compared to 36% of women in the control group. The difference observed was statistically significant ($X^2 = 13.5$, $P=0.001^*$). Furthermore a statistically significant difference was not detected as regards the occurrence of postpartum hemorrhage between the study and control groups. As table 5 indicates, only two (0.2%) of women in the oligohydramnios group had postpartum hemorrhage compared to three (3.0%) in the control group.

Table 6 points to statistical significant differences between the newborns of women in both the study and control groups in their Apgar scores at the 1st minute and at 5th minute ($P=0.000^*$). It is clear that women in the oligohydramnios group had less mean Apgar score than the control group (8.8 ± 0.9 vs. 9.3 ± 0.7 respectively). As for the birth weight, the median birth weight were quite close (3.1 ± 0.5 vs. 3.2 ± 0.4 respectively) with no statistically significant difference ($P=0.261$).

It is obvious from **figure 1** that the newborns of oligohydramnios women had higher percentage of IUGR and meconium stained liquor compared to those in the control group (2.0% & 30.0% vs. none & 12.0% respectively). Meanwhile, (2.0%) women in the study group had congenital anomaly of their newborn and the rate of birth asphyxia was 4.0% compared to none in the control group as shown in **figure 1**. Moreover, more than one fifth (21.0%) of the study group was in need for resuscitation compared to 12.0% in the control group, and 15.0% of the newborn in the study group needs admission to NICU compared to 3.0% in the control group. Statistically significant differences was as regard to meconium stained liquor and admission to NICU. P- value = .002 & .003 respectively.

IV. Discussion:

Assessment of AFV during the antenatal period is considered a helpful tool in determining who is at risk for potentially adverse perinatal outcome. (23) Thus This study was carried out to assess the impact of oligohydramnios on maternal and fetal outcome, and to propose a handout guidelines booklet "brochure" in management of oligohydramnios women.

In the present study, the highest percentage of women in the oligohydramnios and control groups (58.0% & 52.0% respectively) had Para one to three. This is partially in agreement with that of **Ghike et al.**, (13) who observed that the majority of the women in both the groups were either nulliparous or Para one. Conversely, **Jagatia et al.**, (19) reported that the incidence of oligohydramnios was more in primipara (52.0%) which is compatible with the study of **Jandial et al.**, (20) and **Petrozella et al.**, (26) who showed that the incidence of oligohydramnios was 60.0% in primigravida.

Such dissimilarities among the results of the above mentioned studies and the present one could be attributed to the differences in the chosen design for the study, sample size and the criteria of its selection.

The present result also revealed that, the women in the study group were more likely to have a shorter mean weeks of gestation compared to the control group (38.9 ± 1.3 vs. 39.4 ± 0.9 respectively). In agreement with this **Gumus et al.**, (16) reported that gestational age at delivery was 37.7 weeks for study group and 38.3 weeks for control group ($p=0.004$). In addition, **Ghike et al.**, (13) reported that the mean age of gestation in women with severe oligohydramnios was 40.30 ± 1.6 weeks and in women with borderline oligohydramnios was 40.08 ± 1.61 weeks.

A possible explanation of the above findings might be related to the fact that oligohydramnios is mostly associated with fetal distress which requires an early interference through induction of labor. (3)

Concerning the current study finding of the significantly higher proportion of abnormal fetal heart rate (fetal deceleration) in the oligohydramnios group, (5); (6); (28) and (13) asserted that the most strongly associated characteristics with oligohydramnios was the higher percentage of women with abnormal fetal heart rate.

Also in agreement with the present study finding **Voxman et al.**, (30) and **Jandial et al.**, (20) observed that, women with oligohydramnios were significantly ($p<0.005$) more likely to have abnormal fetal heart rate tracings. In addition, **Desai et al.**, (11) found an increase in late decelerations in women with low AFI which was statistically of just borderline significance. This is in agreement with the current study finding which revealed that 52% of women who complained from oligohydramnios had late decelerations. Moreover, 7.0% of women who had oligohydramnios had fetal beat to beat variability compared to

3.0% of women in the control group.

The FHR pattern changes and decelerations can be explained by the poor placental functions associated with oligohydramnios. This results in deficient fetal oxygenation and fetal asphyxia which results in abnormal FHR changes.

According to the present study findings, the rate of spontaneous delivery was higher in the control group (80.0%), compared to the study group (58.0%). Conversely, the rate of CS was higher in oligohydramnios group. This is in coherence with **Hanafy (18)** who reported that there is statistically significant increase in the rate of C.S in oligohydramnios group compared with those in the control group (40.0% vs. 20.0% respectively). He also, reported a higher rate of vaginal delivery among the control group than that in the study group (80.0% vs. 60.0%).

In addition, **Kahkhaie et al., (22)** observed that CS was done in 20.2 % in oligohydramnios group and 8.6% in control group. Also, **Ahmad and Munim (1)** noticed a more than two fold higher CS rate in the isolated oligohydramnios group (42.0%) compared to 18% in the control group. Moreover, **Voxman et al., (30)** study in low AFI as a predictor of adverse perinatal outcome found an increased rate of CS in oligohydramnios group (14.7%) because of fetal distress.

Such discrepancies could be explained by the fact that deficient quality resources of antepartum and intrapartum fetal monitoring in the present study setting might influence the rate of detection of all the parameters of fetal heart rate tracing. Thus CS was mostly the best option to overcome the adverse effect on the perinatal outcome.

Concerning fetal outcomes, the present study showed significantly better Apgar score at the first and fifth minutes among babies with normal amniotic fluid index than those with oligohydramnios. This is similar to **Chate et al., (7)** who noticed that the Apgar score of the study group was less than 7 in 30% at 1st minute, and 16% at 5th minute.

In disagreement with the above finding **Umber et al., (29)** showed that, Apgar score of <7 in the oligohydramnios group was 8.0% at 1st minute, and 6.0% at 5th minute. Furthermore, **Golan et al., (14)** reported a low Apgar score at fifth minutes in 4.6% of neonates. While, **Ahmad and Munim (1)** noticed that the Apgar scores at one and five minutes after birth did not show a significant difference between the two groups (P= 0.575).

In this respect, **Sarno et al., (27)** noted a significantly higher rate of fetal distress and low Apgar score in women with oligohydramnios. This is reported to be due to head and cord compression. Dissimilarities between the above mentioned results could be attributed to the available better intrapartum fetal assessment facilities in developed countries. They concluded that liberal use of amnioinfusion in women diagnosed with oligohydramnios might have resulted in improved outcomes which were not seen in previous oligohydramnios at the third trimester and perinatal outcome studies. But amnioinfusion is yet not established in the research setting.

The current study has also demonstrated that, the mean birth weight of the two studied groups was quite alike, with no statistical significant difference. This finding is incongruent with **Conway et al., (8)** and **Alchalabi et al., (2)** and in disagreement with the prospective case control study conducted by **Chate et al., (7)** who noticed that the mean birth weight was less in oligohydramnios group.

The discrepancy among various studies addressing this birth weight has been attributed to the study design, sample size and its characteristics in- addition to meticulous care and attention provided for oligohydramnios patients during the antenatal period.

Meconium staining is an indicator of fetal distress and has its own complication in the newborn. As for the meconium staining liquor shown in the current study, it is evident that almost one third of women in the oligohydramnios group had meconium stained liquor. Of those more newborn aspirate meconium compared to the control group (30.0% vs. 12.0% respectively), with statistical significant difference. This finding is matching with many research studies in different countries and during various times

Chandra et al., (6); Sriya et al., (28); Chate et al., (7); and Ghike et al., (13). In addition **Jandial et al., (20)**, observed meconium stained liquor in 48.0% of women with oligohydramnios. While, **Youssef et al., (32)** identified it in 40.0% of the oligohydramnios group. This suggests that there is high incidence of meconium staining and poor placental reserve in oligohydramnios group.

The current study has also demonstrated a higher percentage of congenital anomalies in the study group than the control group, but with no statistical significant difference (2.0% vs.

0.0% respectively). However, the incidence reported by **Guin et al., (15)** and **Chate et al., (7)** was much higher than the present study (8.5 % & 6.0 % respectively), this is most probably due to the sample size and its characteristics.

The current study findings revealed that Statistical significant difference was noted between the two groups ($p=0.003^*$) as regards admission to neonatal intensive care unit (NICU). As

15.0% of neonates in the oligohydramnios group had been admitted to NICU compared to 3.0% in the control group. This is consistent with the studies of **Johnson et al., (21)** and **Jagatia et al., (19)** who found that 20.0% of neonates had NICU admission. It also agrees with **Garmel et al., (12)** and **Jandial et al., (20)** who noticed that the rate of NICU admission was found to be

16.0% and 18.5% respectively. Conversely, **Hanafy, (18)** reported that the admission to NICU was not significantly increased in the oligohydramnios group ($P= 0.62$).

V. Conclusion:

An amniotic fluid index of ≤ 5 cm detected after 36 completed weeks of gestation is an indicator of poor perinatal outcome.

VI. Recommendations:

Determination of AFI should be used as an adjunct to other fetal surveillance methods. It helps to identify those infants at risk of poor perinatal outcome and is a valuable screening test for predicting fetal distress in labor requiring cesarean section in oligohydramnios women.

Continuous antepartum and intrapartum monitoring are mandatory for every women diagnosed with oligohydramnios to reduce the maternal and neonatal risks associated with oligohydramnios.

Nurse's knowledge about care provided to women having oligohydramnios must be periodically upgraded through scientific conferences, meetings, seminars and workshops because nurses have a significant role and profound impact in ante and intrapartum monitoring of this risk group.

The suggested plan of action:

1. Development of health instruction brochure to raise the pregnant women's awareness regarding oligohydramnios and its management.
2. The brochure should include knowledge related to the definition of oligohydramnios and its maternal and fetal outcome.
3. The brochure should be distributed to the pregnant women during their scheduled antenatal visit.
4. Meeting with the antenatal clinic nurses to encourage them to educate pregnant women about oligohydramnios, its maternal and fetal complication, and the plan of action.
5. Referral of the women who had oligohydramnios to the proper channels for further examination.

Acknowledgment

We would like to thank all pregnant women who agreed to participate in the study and helped us to shed light on oligohydramnios as an important element during pregnancy. Also, gave us the opportunity to accomplish this study.

Table 1: Current obstetric data of women in oligohydramnios and control groups (n=200):

Current obstetric history	Groups				χ ²	P
	Oligohydramnios (n=100)		Control (n=100)			
	No	%	No	%		
Parity						
▪ Nulliparas	38	38.0	42	42.0	1.8	0.398 [^]
▪ 1-3	58	58.0	52	52.0		
▪ 4+	4	4.0	6	6.0		
▪ Mean ±SD	1.7 ±1.1		1.9 ±1.2		t=1.2	0.238
Gestational age by US						
Range	36-40		36-40		t=3.2	0.002*
Mean ± SD	38.9 ±1.3		39.4 ± 0.9			
Leakage of fluid from vagina					FEP	0.651
▪ Yes	2	2.0	3	3.0		
▪ No	98	98.0	97	97.0		
Previous history of Oligohydramnios					4.7	0.030*!
▪ Yes	7	7.0	1	1.0		
▪ No	93	93.0	99	99.0		

FEP: P value based on Fisher exact probability
t: students t-test for independent groups

!: P value based on Fisher exact probability
* P < 0.05 (significant)

Table 2: Assessment of women condition and FHR upon admission to labor room among oligohydramnios and control groups (n=200):

Labor data	Groups				FEP
	Oligohydramnios (n=100)		Control (n=100)		
	No	%	No	%	
Phase of labor					
▪ Latent	29	29.0	2	2.0	0.000*
▪ Active	71	71.0	98	98.0	
FHR (fetal heart rate)					0.020* [^]
▪ Normal (110-160)	36	36.0	58	58.0	
▪ Tachycardia (>160)	1	1.0	0	0.0	
▪ Bradycardia (<110)	4	4.0	5	5.0	
▪ Variable decelerations	52	52.0	34	34.0	
▪ Beat to beat variability	7	7.0	3	3.0	

FEP: P value based on Fisher exact probability
[^] P value based on Mont Carlo exact probability
* P < 0.05 (significant)

Table 3: Ultrasonographic findings upon admission to labor room among women in oligohydramnios and control groups (n=200):

Ultrasonography	Groups				MCP
	Oligohydramnios (n=100)		Control (n=100)		
	No	%	No	%	
Amniotic fluid index					0.000*^A
▪ Normal	0	0.0	100	100.0	
▪ Abnormal	100	100.0	0	0.0	
▪ 0 – 2	54	54.0	0	0.0	
▪ 3 – 5	46	46.0	0	0.0	
Amniotic fluid volume					0.000*
▪ Average	0	0.0	100	100.0	
▪ Reduced	46	46.0	0	0.0	
▪ Markedly reduced	54	54.0	0	0.0	
Amniotic fluid color					0.005*
▪ Clear	77	77.0	93	93.0	
▪ Turbid	22	22.0	6	6.0	
▪ Moderate turbidity	1	1.0	1	1.0	
Fetal anomalies					0.155
▪ No	98	98.0	100	100.0	
▪ Congenital malformation	2	2.0	0	0.0	

MCP: P value based on Mont Carlo exact probability

! P value based on Fisher exact probability

* P < 0.05 (significant)

Table 4: First stage of labor findings among women in oligohydramnios and control groups (n=200):

First stage labor data	Groups				χ ²	P
	Oligohydramnios (n=100)		Control (n=100)			
	No	%	No	%		
Active phase (4-7 cm)					27.8	0.000*
No	29	29.0	2	2.0		
Yes	71	71.0	98	98.0		
Labor progress	(n=71)		(n=98)		0.09	0.753
Normal	65	91.5	91	92.9		
Abnormal	6	8.5	7	7.1		
Uterine contractions	(n=71)		(n=98)		0.15	0.695
Normal	67	94.4	91	92.9		
Abnormal	4	5.6	7	7.1		

* P < 0.05 (significant)

Table 5: Second and third stage of labor findings among women in oligohydramnios and control groups (n=200):

Second&Third stage data	Groups				χ ²	P
	Oligohydramnios (n=100)		Control (n=100)			
	No	%	No	%		
Mode of delivery	(n=100)		(n=100)		11.3	0.001*
▪ /Vaginal Delivery	58	58.0	80	80.0		
▪ Cesarean Section	42	42.0	20	20.0		
Delivery of placenta	(n=100)		(n=100)		13.5	0.001*
▪ Spontaneous	38	38.0	64	64.0		
▪ Active management	62	62.0	36	36.0		
Postpartum Hemorrhage					FEP	0.651
▪ Yes	2	2.0	3	3.0		
▪ No	98	98.0	97	97.0		

FEP: P value based on Fisher exact probability

* P < 0.05 (significant)

Table 6 Distribution of the studied women according to Apgar score and birth weight in oligohydramnios and control groups (n=200):

Neonatal outcome	Groups		T	P
	Oligohydramnios (n=100)	Control (n=100)		
1st minute Apgar score			4.5	0.000*
▪ Mean± SD	5.6±1.1	6.3±1.2		
5th minute Apgar score			4.5	0.000*
▪ Mean± SD	8.8±0.96	9.3±0.79		
Birth weight (kg)			1.1	0.261
▪ Mean± SD	3.1±0.5	3.2±0.4		

t: students t-test for independent groups

* P < 0.05 (significant)

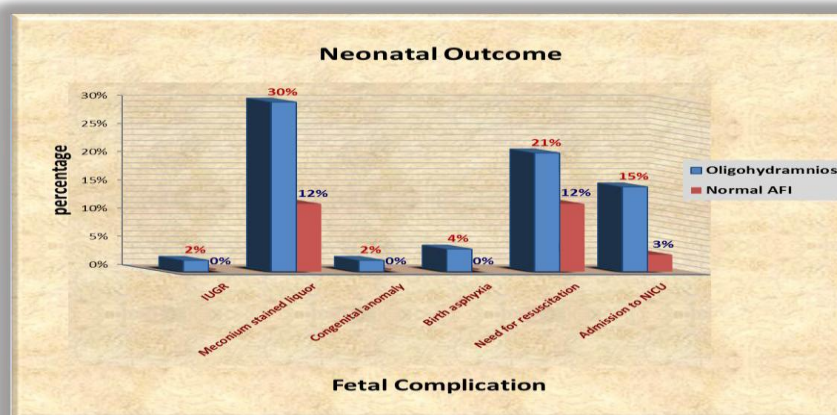


Figure 1: Distribution of the studied women according to neonatal complications.

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