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RESEARCH ARTICLE

PREVALENCE OF PREGNANT WOMEN WITH OLIGOHYDRAMNIOS AND ITS EFFECT ON MATERNAL AND FETAL OUTCOME

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Abstract

Oligohydramnios is a pregnancy condition characterized by low volume of amniotic fluid. Based on ultrasound measurement, it is defined as an amniotic fluid index (AFI) ≤ 5cm and associated with adverse fetal and maternal outcomes. To study the prevalence of oligohydramnios and its effect on maternal and fetal outcome in third trimester (≥ 28 weeks) of pregnant women admitted at AL-Sadaqa Teaching Hospital in the period of study from 1st January to 31st December 2020. This study is a prospective descriptive study was performed at AL-Sadaqa Teaching Hospital, Gynecology and Obstetrics Department among 100 pregnant women in third trimester diagnosed as oligohydramnios by ultrasound (AFI≤ 5cm). The results were analyzed by using the statistical package social software (SPSS), version 25. The study showed the prevalence of oligohydramnios during study period was (1.5%), and the mean age of the affected women was 27.72 ± 6.8 years. The half of the cases were in age group between 20-29 years (50%) and the gestational age were between 37-40 weeks (50%), and slightly more than half of the women were nulliparous (58%). The rate of caesarean section was (56%), and the most indication for cesarean section was fetal distress (42.9%). The fetal complications showed in this study were low birth weight (40%), preterm birth (27%) and meconium aspiration (11%). The Apgar score <7 in 5th minutes was (17%) of the newborns and the rate of perinatal mortality was (7%). The prevalence of oligohydramnios in this study was (1.5%) which is within the normal limit worldwide. The study showed that the oligohydramnios in a pregnant woman has many complications for the fetus as well as the mother, but it more dangerous for the fetus. For mother there is increase intervention in the form of induction of labor and cesarean delivery. An early detection of oligohydramnios, identification of the risk factors and its management may help in reduction of these complications.

Keywords: Oligohydramnios, Amniotic fluid index, Cesarean section, Perinatal outcomes.

Introduction

The amniotic fluid is clear watery fluid that is surrounded by sac called the amnion. The possible sources of amniotic fluid in the first trimester include a transudate of maternal plasma through the chorioamnion or from fetal plasma through the permeable fetal skin prior to keratinization. In the second and third trimester of pregnancy amniotic fluid volume is maintained by a balance of fetal fluid production in lung fluid and urine as well as fluid resorption in fetal swallowing and flow across the fetal membranes to the uterus [1].

The volume of amniotic fluid is found to be normally different according to gestational weeks. It is normally increased from 50 ml at 12 weeks and going to be raised to 400 ml at mid pregnancy period and 1000 ml at term and decreased after[2]. As a result, amniotic fluid volume (AFV) evaluation is a component of every standard sonogram or obstetric scan and one component of antepartum fetal surveillance[3, 4].

Oligohydramnios is one of the common clinical conditions in which plays an important role in obstetrics field by direct relation of maternal and fetal outcome. It might be seen among pregnant mothers during routine follow up or discovered accidently in whom not been attending regularly in antenatal care clinics during pregnancy period.

The terminology of oligohydramnios is referring to be reduction of amniotic fluid volume less than expected for gestational age (GA). Otherwise, when AFV is much more than expected for GA, it is called polyhydramnios. According to sonographic criteria, oligohydramnios

defined as an amniotic fluid index (AFI) less than 5th centile for gestation[5], or AFI ≤ 5 cm [6], or the single deepest pocket (SDP) is less than 2 cm [7].The American College of Obstetricians and Gynecologists practice bulletins have defined an AFI of greater than 5.0 cm and less than 24 cm as consistent with a normal AFV[8].

Oligohydramnios is prevalent in approximately 1% to 5% of all pregnancies. However, the prevalence of it can be increased much more after 41 weeks and in post term pregnancies in approximately 12-14% and 30% respectively [9-11].

The etiology of oligohydramnios may be idiopathic or maternal cause (such as preeclampsia, chronic hypertension) or fetal cause (such as congenital abnormalities, post-term pregnancy, Rupture of membranes and IUGR associated with placental insufficiency) or placental cause (such as Abruptio placenta and twin-twin transfusion) [12].

Oligohydramnios is a threatening condition to fetal health and is associated with increased risk of intrauterine growth retardation, meconium stained liquor, non-reassuring fetal heart rate, increase rate of C/S and increase perinatal morbidity and mortality [13]. In both developed and developing countries, cesarean deliveries have chosen in oligohydramnios cases ranging from 42.0% – 83.6%[11,14-16].

Management of oligohydramnios is facing a difficult decision making for both maternal and fetal health especially in set– ups without continuous fetal monitoring[10]. However, making a rational decision between vaginal delivery and C/S should be done and balancing between advantages and disadvantages must be considered, so that unnecessary maternal morbidity is prevented and perinatal morbidity and mortality are reduced [10, 11].

The objective of this study was to study the prevalence of oligohydramnios during third trimester and its effect on maternal and fetal outcome in third trimester of pregnant admitted at AL-Sadaqa Teaching Hospital.

Materials and Methods

This is a prospective descriptive study involved all pregnant women admitted at AL-Sadaqa Teaching Hospital, Gynecology and Obstetrics Department in third trimester of pregnancy (≥ 28 weeks) diagnosed as oligohydramnios by US (AFI≤ 5cm) during the period from 1st January to 31st December 2020.

Inclusion criteria:

1. All pregnant women ≥ 28 weeks with oligohydramnios.
2. AFI ≤ 5cm by transabdominal US.
3. Intact membrane.
4. Single alive fetus.
5. We include if there are fetal anomalies.
6. Vertex presentation.
7. We include the obstetric complication (pregnancy induced hypertension (PIH), diabetes mellitus (DM) and intrauterine growth restriction (IUGR).

Exclusion criteria:

1. All pregnant women < 28 weeks with oligohydramnios.
2. AFI >5cm by transabdominal US.
3. Rupture membranes.
4. Malpresentation.
5. Multiple gestation.
6. Intrauterine fetal death.

Data collection

Information was collected using specifically designed closed questionnaire, through direct personal interview with the patients by the researcher and other resident doctors who received the cases during their duties in labor ward. A detailed history, complete examination and routine laboratory investigation was done. Information on socio-demographic and obstetric history including (maternal age, GA, parity). Maternal and fetal outcome were recorded which included the mode of delivery, indication of caesarean section, Apgar score at 5th minutes, birth weight, perinatal morbidity and mortality.

The study protocol was approved by institution ethical committee, and informed consent of all those patients, who were involved in the study was obtained after providing them detailed explanation of the objectives, importance and benefits of the study and confidentiality of information was maintained.

Statistical Analysis

Data analysis was performed using SPSS version 25 (IBM Inc., Chicago, USA). Categorical data were expressed as frequencies (numbers and percentage) and numerical data as mean ± standard deviation for normally distributed data. Quantitative data were compared using T- test or One-way analysis of variance (ANOVA) in parametric data. The 95% confidence interval was determined and p- value of less than 0.05 as statistically significant (p< 0.05).

Results

Among the total of 6637 deliveries occurred during the study period, 100 women were in the third trimester (≥28wks) of pregnancy diagnosed with oligohydramnios and the prevalence of oligohydramnios was (1.5%) (95% CI=1.2% -1.8%) (Figure 1).

Half of the cases were in age group between 20-29 years (50%) and the mean age of the affected women was 27.72 ± 6.8 years with no significant association between the maternal age and AFI (P=0.47). The mean of gestational age was 38.13 ± 2.9 weeks and (50%) of cases were in the gestational age between 37-40 weeks with a statistically significant association between gestational age and AFI (P=0.04). Slightly more than half of the women were nulliparous (58%) with no significant association between parity and AFI (p= 0.18) (Table 1).

Among oligohydramnios pregnant women about (56%) were highly terminated by cesarean section in comparison to vaginal delivery (44%). In women with vaginal delivery, about 24% of them were induced, while others 20% had spontaneous vaginal delivery with a statistically significant relationship between mode of delivery and AFI (P=0.03) (Table 2).

The main indication for cesarean section in pregnant women with oligohydramnios was fetal distress (42.9 %) (Table 3).

Out of total deliveries (40%) of newborns recorded with low birth weight (LBW) (<2500 gm) in comparison to newborns with normal birth weight ≥2500 gm (60%). There was a highly statistically significant relationship between the birth weight and the AFI (p=0.000). About (17%) of newborns had Apgar score <7 in comparison to newborns who had Apgar score ≥ 7 (80%). There was a statistically significant relationship between the Apgar score and the AFI (p= 0.004). The fetal complications mainly due to LBW, preterm births and meconium aspiration were (40%), (27%) and (11%) respectively. There was a statistically significant relationship between the perinatal morbidity and the AFI (P=0.01).

The majority of fetuses from oligohydramnios cases (97%) were born alive, while fresh stillbirths were only (3%). Among the alive neonates 97%, about (4%) were dead in an early neonatal period.

The total perinatal mortality observed in our study was (7%), in comparison to alive neonate (93%) with a statistically significant relationship between the perinatal mortality and the AFI (p=0.02) (Table 4).

Discussion

In the present study the prevalence of oligohydramnios in the third trimester was (1.5%), this result is concurred to that reported studies in Pakistan [17], India [18], Sudan [19] and Northern Ethiopia [20] which the prevalence of oligohydramnios were 1.5%, 2.17%, 2.6% and 3.2% respectively.

Alchalabi HA et al [21] and Ghimire S et al [22] reported that the maternal age between 20-29 years were at 71.2% and 68% respectively. These results were more than our finding which (50%) of women were in the age group between (20-29 years), this reflects that the childbearing age of women was more common in this study.

The mean maternal age was (27.7 ± 6.8 years), which is in agreement with previous studies done by Musthaq et al[23] and Yenigul et al [24] found that the mean maternal age were 27.6 ± 4.2 years and 27.1 ± 5.6 years respectively.

Alnakash AH et al in Iraq reported that there was no significant relationship between the amniotic fluid disorder and maternal age[25] , Cakmak Celik F et al in Turkey observed that the maternal age has no effect on perinatal and neonatal outcomes[26]. These findings correspond to our result which showed no significant association between the oligohydramnios and maternal age (p=0.47).

The mean gestational age in this study was (38.1 ± 2.9 weeks) which is similar to previous studies obtained by Figueroa et al [17] , Hamed A et al [27] and Biradar KD et al [28] were 37.7 ± 2.9 weeks, , 38.9 ± 1.3 weeks, and 38.5 ± 2.1 weeks respectively. These findings indicate that the problem of oligohydramnios was more common in later part of pregnancy. It is mainly due to the physiological or pathological cause of reduced placental perfusion near term.

In this study (50%) of oligohydramnios cases in gestational age between (37-40 weeks) with a statistically significant association between GA and AFI (p= 0.04). In a study by Gurung SD et al [29] reported that the oligohydramnios cases were mostly developed with term GA between 37-40 weeks (52%) with a statistically significant association between GA and AFI(p= 0.05), Minwuye T et al [30] found that oligohydramnios were more developed in GA between 37-40 weeks (61.2%) with a statistically significant association between GA and AFI(p= 0.01).

In current study most of the nulliparous (58%) had oligohydramnios with no significant relationship between oligohydramnios and parity (p= 0.18). This finding is similar to study by Gehlot N et al[31] in India showed that most of oligohydramnios cases were nulliparous (54%) and there were no significant relationship between oligohydramnios and parity(p= 0.080).

The intrapartum oligohydramnios was associated with an increased risk of C/S for fetal distress due to umbilical cord compressed which results in impaired blood flow to fetus [30].

In our study the rate of cesarean section was (56%) in oligohydramnios cases with a significant association between mode of delivery and AFI(P=0.03). This is similar to study done by Niamrat T et al[32] in Thailand reported that the rate of C/S was(55.6%) with a statistically significant value (p=0.001).

The present study showed the most common indication for C/S was fetal distress (42.9%) which is similar to the studies conducted by Molla M et al[33] showed that the most common indication for C/S was fetal distress in pregnant women with oligohydramnios (40.3%) and Amin A et al

[34] observed that the most common indication for C/S was fetal distress (47.5%). On the other hand, Niamrat T et al[32] reported a low rate of fetal distress for C/S (14.7%) which might be due to closed monitoring in antepartum and intrapartum pregnant women who had oligohydramnios.

The perinatal morbidity in this study mainly due to LBW, preterm births and meconium aspiration. The possible explanation of the increased perinatal morbidity and mortality could be due to umbilical cord compression, potential uteroplacental insufficiency and the increased incidence of meconium aspiration [35].

In present study the rate of low birth weight was (40%) with a highly significant association with AFI (P=0.000). Bian Y et al [36] in China reported that the oligohydramnios was a risky factor for LBW and a significant association between oligohydramnios and LBW p =0.01.

On the contrary, Ghimire S et al [22] and Yimam Y et al[37] reported no significant relationship between oligohydramnios and LBW .

Tripathi M et al [38] in Nepal reported that the Apgar score which was less than 7 was 18.3% and a significant association with AFI p=0.008. This result is similar to the present study which reported that the Apgar score which was less than 7 at 5 minutes was (17.3%) and a significant association between Apgar score and AFI (p=0.004). While Sarno AP et al [39] in U.S.A found that the Apgar score after 5 minutes < 7 was 5.9%. This difference in rates is observed because of the better intrapartum fetal assessment facilities which are available in developed countries.

Previous studies by Patel R et al [35] and Figueroa et al [17] reported that the rate of preterm babies were 30% and 31.8% respectively in oligohydramnios cases. These results are similar to our study which showed that the preterm birth was (27%) in oligohydramnios women.

In our study (11%) of babies developed meconium aspiration which is similar finding obtained by Vidyasagar V et al [40] in India reported that the meconium aspiration in oligohydramnios cases were 9.76%, whereas Kemal S et al [41] in Pakistan showed a low rate of meconium aspiration 4%.

In our study, 16 of babies with meconium stained amniotic fluid (MSAF], 11 of them were developed meconium aspiration and 8 were delivered by C/S due to fetal distress, while other 3 babies were stillbirth who delivered vaginally, for that reason the MSAF is one of the indicators of fetal distress[42].

In present study the perinatal morbidity significant association with oligohydramnios, this result is in agreement with other studies [43,44].

The perinatal mortality in this study was 7%, out of which 3% were still births and 4% early neonatal deaths. There was a statistically significant association between the perinatal mortality and oligohydramnios (p=0.02), this finding is similar to study done by Morris R et al [45] found that the strong association between oligohydramnios and fetal mortality. Ghimire S et al [22] showed that the perinatal mortality was a statistically significant with oligohydramnios p= 0.03.

Overall, the perinatal mortality is markedly increased in women with oligohydramnios, so that the lack of amniotic fluid allows compression of fetal abdomen, which limits the movement of diaphragm. Although, Chate P et al[46] from India demonstrated higher neonatal mortality in oligohydramnios cases, but there was no statistically significant difference between perinatal mortality and decrease amniotic volume.

Limitations

1-This study is conducted at a hospital-based which made it rather difficult to generalize the findings to all population.

2- The diagnosis of fetal distress was made depending on FHR tracings because other methods like CTG and biophysical profile non- available for all sample sizes.

3-We only had information about immediate perinatal morbidity and mortality until time of discharge from the hospital, and therefore, some outcomes might be underestimated.

Conclusions

The prevalence of oligohydramnios in the third trimester at AL- Sadaqa Teaching Hospital is (1.5%) which is considered within the range quoted throughout most global studies.

Oligohydramnios is the most common case found in childbearing age (20-29 years), in nulliparous and in term gestational age (37-40 weeks). Also it is associated with an increased pregnancy intervention in the form of induction of labor and caesarean delivery, and the common indication for caesarian delivery was the fetal distress.

Oligohydramnios is associated with an increase in perinatal morbidity as in preterm births, low birth weight and meconium aspiration which are the commonest perinatal outcome. The present study showed that that lower amniotic fluid index is associated with higher rate of cesarean section, low birth weight, low 5 minutes Apgar score and increased rate of perinatal mortality.

Tables and Figures

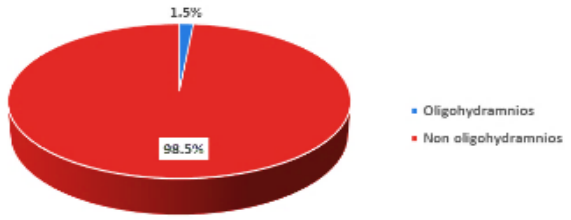

Fig 1. prevalence of oligohydramnios

Table 1: Distribution of oligohydramnios women according to socio-demographic, obstetric characteristics and association with AFI

Socio-demographic and obstetric characteristics	NO.	%	P Value
Maternal age (Mean± SD)	(27.72 ± 6.8)		**0.47**
< 20 years	10	10%	
20-29 years	50	50%	
30-39 years	34	34%	
≥ 40 years	6	6%	
Total	100	100%	
Gestational age (Mean ± SD)	(38.13 ± 2.9)		**0.04**
28-33 weeks	5	5%	
34-36 weeks	22	22%	
37-40 weeks	50	50%	
≥ 41 weeks	23	23%	
Total	100	100%	
Parity			**0.18**
Nulliparous	58	58%	
Pluripara	20	20%	
Multipara	9	9%	
Grand multipara	13	13%	
Total	100	100%	

One-way a nova test

Table 2: Distribution of oligohydramnios women according to mode of delivery and association with AFI

Mode of delivery		NO.	%	P Value
Vaginal delivery	Spontaneous vag. delivery	20	20%	**0.03**
	Induced vag. delivery	24	24%	
Total		44	44%	
Cesarean section	Emergency C/S	39	39%	
	Elective C/S	17	17%	
Total		56	56%	
Total		100	100%	

Independent T- test

Table 3: Distribution of oligohydramnios women according to indication of cesarean section (n=56)

Indication of cesarean section	NO.	%
Fetal distress	24	**42.9%**
Oligohydramnios with previous scare	12	**21.4%**
CPD	6	**10.7%**
Fetal macrosomia	6	**10.7%**
Poor BPP score	4	**7.1%**
Failed induction	3	**5.4%**
Placenta Previa) (Antepartum hemorrhage	1	**1.8%**
Total	56	**100%**

Table 4: Perinatal outcome among oligohydramnios women and association with AFI

Perinatal outcome	NO.	%	P Value
Birth weight (Mean ± SD)	(0.7 ± 2.54)		**0.000**
<2500 gm	40	40%	
≥2500 gm	60	60%	
Apgar score at 5 minutes			**0.004**
<7	17	17%	
≥7	80	80%	
Still births	3	3%	
Perinatal morbidity			**0.01**
Preterm birth	27	27%	
Meconium aspiration	11	11%	
Respiratory distress	4	4%	
Neonatal sepsis	4	4 %	
Perinatal mortality			**0.02**
Yes	7	7%	
No	93	93%	
Total	100		

Independent T- test, One-way a nova test

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مقالة بحثية

انتشار نقص السائل الامنيوسي في النساء الحوامل ونتائجه على الأمهات والمواليد

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المُلخّص

نقص السائل الامنيوسي هي حالة حمل تتميز بانخفاض حجم السائل الامنيوسي بناءً على القياس بالموجات فوق الصوتية يتم تعريفة على انه≥5سم ويرتبط بنتائج سلبية على المواليد والامهات (AFI) مؤشر السائل الامنيوسي. هدف البحث لتحديد نتائج الأمهات والمواليد لقلة السائل الامنيوسي في الثلث الاخير من الحمل (≤ 28 أسبوعًا) للحوامل اللواتي تم ادخالهن في مستشفى الصداقة التعليمي خلال فترة الدراسة من 1 يناير إلى 31 ديسمبر2020. هذه الدراسة هي دراسة وصفية مستقبلية تم إجراؤها في مستشفى الصداقة التعليمي، قسم أمراض النساء والتوليد على 100 امرأة حامل في الثلث الاخير من الحمل تم تشخيصهن بقلة السائل الامنيوسي بواسطة الموجات فوق الصوتية (AFI) ≥ 5سم. تم تسجيل المواضيع في هذه الدراسة بعد تطبيق معايير الاشتمال والاستبعاد. عند القبول تم إجراء تاريخ مفصل والفحص لهن. وتم تحليل النتائج باستخدام برنامج الحزمة الإحصائية الاجتماعية (SPSS) الإصدار 25. أظهرت الدراسة أن معدل انتشار قلة السائل الامنيوسي خلال فترة الدراسة كان (1.5٪)، وكان متوسط عمر النساء المصابات 6.8±27.72سنة. نصف الحالات في الفئة العمرية بين 20-29 سنة (50%) وعمر الحمل بين 37-40 أسبوع (50%)، وكان ما يزيد قليلا عن نصف النساء هن في الولادة الأولى (58%). وكانت نسبة العمليات القيصرية (56%)، وكان أكثر المؤشرات لإجراء عملية قيصرية هو الضائقة الجنينية (42.9%). كانت مضاعفات المواليد التي أظهرتها هذه الدراسة هي انخفاض الوزن عند الولادة (40٪) والولادة المبكرة (27٪) وابتلاع السائل الامنيوسي (11٪). وكانت درجة أبجار أقل من 7 في الدقيقة الخامسة (17%) من الأطفال حديثي الولادة. وكان معدل وفيات المواليد (7%). كان معدل انتشار قلة السائل الامنيوسي في هذه الدراسة (1.5%) ضمن الحد الطبيعي في جميع أنحاء العالم. أظهرت الدراسة أن قلة السائل الامنيوسي لدى المرأة الحامل لها العديد من المضاعفات على الجنين والأم، لكنها أكثر خطورة على الجنين. بالنسبة للأم، هناك زيادة في التدخل في شكل تحريض المخاض والولادة القيصرية. الكشف المبكر عن قلة السائل الامنيوسي وتحديد عوامل الخطورة ومعالجتها مما قد يساعد في التقليل من هذه المضاعفات.

الكلمات المفتاحية: نقص السائل الامنيوسي، مؤشر السائل الامنيوسي، العملية القيصرية، نتائج المواليد.

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