

FETO-MATERNAL OUTCOME OF OLIGOHYDRAMNIOS IN VIABLE PREGNANCY

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ABSTRACT

Background: Oligohydramnios is a clinical condition characterized by Amniotic fluid index (AFI) ≤ 5 cm by sonographic assessment. It has significant impact on perinatal outcome and maternal morbidity. Therefore, the present study is undertaken to study the etiology and impact of oligohydramnios on fetomaternal outcome in viable pregnancies. (Beyond 28 week of gestation). **Material and Methods:** The present study was prospective observation cohort study carried out in the department of Obstetrics and Gynaecology, at pt J.N.M Medical College & Dr Bhim Rao Ambedkar Medical Hospital Raipur from January 2019 to January 2020. **Result:** The incidence of Oligohydramnios was 2.1%.in our study there was a significant association of severity of Oligohydramnios with socioeconomic status (p value < 0.00001) booking status (p value < 0.00001), parity (p value 0.028672), gestational age (p value < 0.00001). In women with Oligohydramnios most common risk factor was anemia in 515(63%) with p value 0.000249 showing a significant association. Similarly, 333(40.6%) of IUGR babies were also significantly associated with Oligohydramnios, with 1.64 time greater risk of having Oligohydramnios. There was a significant correlation between Doppler finding and birth weight (p value < 0.00001), apgar < 7 in 1 min (p value 0.040621) and NICU admission (p value 0.009761) suggesting that abnormal Doppler finding may lead to adverse perinatal outcome. We found a significant relation between severity of Oligohydramnios with adverse perinatal outcome in term birth weight (P value 0.001492), Apgar < 7 in 1min (p value), colour of liquor (p value < 0.00001), NICU admission (p value 0.000048), neonatal death (p value < 0.00001) suggesting that AFI < 3 had poor perinatal outcome. **Conclusion:** The study showed that an amniotic fluid index of less than 5 was associated with adverse maternal and perinatal pregnancy outcome emphasizing the importance of amniotic fluid volume surveillance during the antenatal period.

INTRODUCTION

The incidence of Oligohydramnios is reported to be around 1 to 5 % of total pregnancies.^[1] In pregnancies of more than 40 weeks of gestation, the incidence may be more than 12% as the amniotic fluid declines progressively after 41 week of gestation.^[2] Oligohydramnios can lead to multiple intrapartum complications which can cause perinatal morbidity and mortality. The sequel of longstanding Oligohydramnios may include pulmonary hypoplasia, musculoskeletal abnormalities such as facial distortion and clubfoot, intrauterine growth

restriction, cord compression, low APGAR score and acidosis at birth, meconium staining, still birth and neonatal death and increase rate cesarean section for fetal distress and operative vaginal delivery (forceps or vacuum extraction).^[3] Therefore Oligohydramnios is a condition which requires proper antepartum and intrapartum care and timely decision between vaginal delivery and caesarean section so that Unnecessary maternal morbidity can be prevented.

Hence, the present study was undertaken to study the etiology and impact of Oligohydramnios on fetomaternal outcome in viable pregnancies. (Beyond 28 week of gestation).

MATERIALS AND METHODS

The present study “Study of Fetomaternal outcome of Oligohydramnios in viable pregnancy”.

Study Design: Prospective Observational Cohort study

Study Place: Pt.J.N.M Medical College and Dr. B.R.A.M Hospital Raipur (C.G)

Study Approval: From Scientific Committee and Institutional Ethics Committee.

Study Duration: January 2019-2020

Sample Size: 320, But we have recruited 819 women diagnosed with oligohydramnios.

STUDY POPULATION: All the antenatal women admitted in the department of Obstetrics and Gynecology diagnosed with oligohydramnios (after 28 week) confirmed with ultra sonography.

Inclusion Criteria

- AFI < 5
- Singleton pregnancy with gestational age 28 to 42 weeks
- Pregnancies without anomaly
- Intact membrane

Exclusion Criteria

- AFI > 5
- Singleton pregnancy with gestational age < 28 weeks.
- Women with multiple gestation
- Women with fetus having congenital anomaly like renal agenesis polycystic kidney disease
- Ruptured membrane
- Pt on any drug that may cause oligohydramnios

This study consists of analysis of pregnancy outcome in antenatal women with diagnosis of oligohydramnios by ultrasound after 28 completed week of gestation.

Women who had 4 or more visits at our hospital were considered as booked case. Women with 3 or less visit were considered as unbooked cases.

Ethical approval from taken before collecting data and informed consent was taken from each patient prior to the study.

For all the selected cases, thorough history was taken and complete examination was done. Clinical evidence of oligohydramnios was looked for. The previous obstetric records and ultrasound reports were reviewed.

For all the women baseline investigation like Hb %, blood group, and Rh typing, urine examination was done. Fetal surveillance was done by continuous fetal monitoring, USG, NST and Doppler study. Decision on mode of delivery by ideal induction or operative

intervention was done as per required. Artificial rupture of membrane was done in active stage of labour and liquor status was noted. Partograph was plotted to know the progress of labour. All cases were monitored by continuous fetal monitoring. Oxytocin drip was started if contraction were weak. If NST was found to be non reactive, persistent bradycardia or persistent tachycardia, the delivery was expediated by operative intervention. All newborns were attended by Paediatrician. The birth weight Apgar score at 1 and 5min were noted, if Apgar score were low the baby were admitted to NICU. The various outcomes recorded were Mode of delivery, intrapartum complication. At birth, Apgar score, Birth weight, and sex of baby were recorded.

The results were recorded and tabulated. The results were statistically analyzed using parameters like mean, standard deviation and chi square test and the critical level of significance was considered at 0.05 levels.

RESULTS

Total women attending antenatal OPD and Labour room were 37307 out of which we have recruited 819 women in our study with gestational age of about ≥ 28 week and an Amniotic fluid index of about ≤ 5 cm who were ultrasonographically detected at the time of admission and met the requirements for inclusion and exclusion. In our analysis, the incidence of oligohydramnios was 2.1%. The mean age was 23.83 ± 3.45 . In our study, 139 women belong to Class III and 680 women belong to Class IV. The socioeconomic status and severity of oligohydramnios were significantly correlated (p value < 0.00001) in our study.

In our study, 528 (65%) were unbooked and only 290 (35%) were booked, and our study showed a significant correlation between the severity of oligohydramnios and booking status (p value < 0.00001). Approximately 493 (60 percent) of the 819 women diagnosed with oligohydramnios were primigravida and 40 percent (326) multigravida, and our research demonstrated a significant correlation between the severity of oligohydramnios and gravidity (p value 0.028672).

In our study we found a significant association between gestational age and severity of oligohydramnios with p value 0.000045 suggesting that prolong and postdated pregnancy played a significant role in oligohydramnios as AFI < 3 were more in more than 40 week of gestation. (Table 1)

Table 1: Association between Severity of Oligohydramnios with Various Factors

Association With Socioeconomic Status				
AFI	Class III	Class IV	Chi square	P value
<3	126	8	675.1137	<0.00001
3-5	13	672		
Association With Booking Status				
AFI	Booked	Unbooked	Chi square	P value
<3	3	131	77.0742	<0.00001
3-5	287	398		

Association With Parity				
AFI	PRIMI	MULTI	Chi square	P value
<3	92	42	4.7872	0.028672
3-5	401	284		
Association With Gestational Age				
AFI	<40wk	>40wk	Chi square	P value
<3	47	85	44.7109	<0.00001
3-5	457	230		

On analyzing antenatal risk factor in women with oligohydramnios most common risk factor was anemia in 515(63%) women due to malnutrition and poor socio economic status. We found significant associated between antenatal risk factor with severity of oligohydramnios. The probability of getting oligohydramnios (p value 0.0000249, RR 1.96) is

1.96 higher. Similarly, 333(40.6%) of IUGR babies were also significantly associated with oligohydramnios, with 1.64 time greater risk of having oligohydramnios. Other risk factor like PIH in 279(34%), postdatism in 315(38.4%), previous cesarean section 104(13%) were also seen with oligohydramnios. (Table 2)

Table 2: Association between Severity Oligohyramnios and Ante Natal Risk

Antenatal Risk	AFI<3	AFI3-5	P value	Relative Risk
Anemia	103	412	0.000249	1.96
PIH	49	230	0.524123	1.12
Postdate	49	266	0.622108	0.92
Hypothyroidism	15	83	0.763425	0.93
RH -ve	07	27	0.49617	1.27
Hyper emesis	13	53	0.444891	1.23
IUGR	71	262	0.001492	1.64
Breech	04	21	0.960431	0.98
Abruption	03	02	-	-
GDM	01	03	0.639649	1.53
Previous cesarean section	08	96	0.010534	0.44
Idiopathic	00	47	-	-

We analyzed outcome of babies based on several variable such as non stress test, color Doppler, mode of delivery, birth weight, liquor color, Apgar score, NICU admission.

Non stress was achieved in all women with live babies. It was noted that 557 (69.8%) were reactive and 240(30.1%) were non reactive. NST showed a significant association with severity of oligohydramnios with (p value <0.00001). (Table 3)

Table 3: Association between Severity of Oligohydramnios and NST

AFI	Reactive	Non-reactive	Total	Chi square	P value
<3	35	82	117	48.311	0.00001
3-5	436	244	680		
Total	471	326	797		

Of 236 women who were having Doppler report, 29 women showed abnormal Doppler finding and 207 had normal Doppler finding. There was a significant correlation between Doppler finding and birth weight

(p value <0.00001), apgar <7 in 1 min (p value 0.040621) and NICU admission (p value 0.009761) suggesting that abnormal Doppler finding may lead to adverse perinatal outcome. (Table 4)

Table 4: Association between Doppler Study and Perinatal Outcome

Birth weight	Abnormal Doppler	Normal Doppler	Chi square	P value
<2.5kg	26	89	22.166	<0.00001
>2.5kg	3	118		
Apgar score	Abnormal Doppler	Normal Doppler	Chi square	P value
<7 in 1 min	17	80	4.1918	0.040621
>7 in 1min	12	127		
Apgar score	Abnormal Doppler	Normal Doppler	Chi square	P value
<7 in 1 min	11	47	3.1812	0.07491
>7 in 1min	18	160		
Colour of liquor	Abnormal Doppler	Normal Doppler	Chi square	P value
Meconium	12	62	1.5433	0.21413
Clear	17	145		
NICU admission	Abnormal Doppler	Normal Doppler	Chi square	P value
Yes	16	64	6.6781	0.009761
No	13	143		

In terms of perinatal outcome, 797 out of 819 babies were live, whereas 22 babies were IUD. In 231 (28%) women we had intrapartum complication in the form of meconium stain liquor and 588 (72%) had clear liquor. In this study, 302(37.8%) babies had an apgar score <7 at 1 min and 160(20%) had an apgar score of <7 at 5min. In 30.48% babies, NICU admission was required. Out of 819 babies 333 babies were having birth weight <2.5kg out of which 61 babies

were preterm and IUGR and 272 babies were IUGR babies. We found a significant relation between severity of oligohydramnios with adverse perinatal outcome in term birth weight (P value 0.001492), Apgar < 7 in 1min (p value), colour of liquor (p value <0.00001), NICU admission (p value 0.000048), neonatal death (p value < 0.00001) suggesting that AFI < 3 had poor perinatal outcome. (Table 5)

Table 5: Association between Severity of Oligohydramnios and Perinatal Outcome

Perinatal Outcome	AFI<3(severe)	AFI 3-5 (moderate)	P value
Birth Weight			
<2.5kg	71	262	0.001492
≥2.5kg	63	423	
APGAR			
≤7in 1min	82	242	0.026283
≤7 in 5min	63	119	
Colour Of Liquor			
Meconium stain liquor	63	168	<0.00001
clear	71	517	
NICU Admission			
Yes	54	189	0.000048
No	62	492	
Neonatal Death			
IUD	18	04	<0.00001
Live	115	682	

DISCUSSION

In present study maximum women belong to the lower middle class (class IV) socio economic status followed by middle class (class III) according to modified Prasad's classification, revised in 2019. P value 0.0001 indicate a significant association between socioeconomic status and Oligohydramnios and indicate that the lower the socio-economic status of women, the greater the likelihood of nutritional deficiency and the reason that maternal nutritional status affect developmental environment of the fetus which consequently affect the birth weight leading to IUGR babies which may be responsible for Oligohydramnios.

In present study it was observed that 63% were from rural area with lower education status indicating lack of information and understanding among women regarding need for an antenatal visit, which is responsible for higher number of unbooked women by 65% in our study. All of these factors aid in delay in seeking help and triggering postdates and prolong pregnancy leading to diminished placental function and oligohydramnios. In our there was significant association between booking status of women with Oligohydramnios with p value <0.00001.

The prevalence of Oligohydramnios was highly reported in primigravidas 60% and we found significant association of severity of oligohydramnios with parity (p value 0.028672). Our result was at par with study conducted by G. Parthasaradhi et al,^[4] where 60% were primigravidas; in Kaur P et al,^[5] 60%; in Sreelakshmi U et al 673%; Krishna J et al 752%; Charu J et al 860%; Chouhan R et al 59.50%; Ahmar R et al 1064.4% were primigravidas.

Amniotic fluid is considered to be reduced with advancing gestational age after 40week. In our study, severe oligohydramnios were more in >40wk of pregnancy showing significant association between gestational age and severity of oligohydramnios with p value <0.00001, suggesting that severe oligohydramnios is more frequently seen in later part of pregnancy.

Even though there is no evidence of anemia as a cause of Oligohydramnios, its high prevalence (63%) and its significant correlation (P value 0.000249) indicate an indirect association with Oligohydramnios. IUGR (40.6%) was the second most common risk factor found significantly associated with Oligohydramnios. In study done by Sreelaxmi U et al,^[6] IUGR was noted in 32%; Vidyasagar V et al,^[11] found IUGR In 46.34%. Similarly other antenatal risk factor like PIH (34%) and post date pregnancy (38.4%) there results were consistent with similar studies like Chandra P et al,^[12] and Sriya R et al,^[13] and Kaur P et al,^[5] where hypertensive disorder was seen in 38.46%, 31%, 32% of cases with oligohydramnios and post date pregnancy was seen in 15.38%, 25%, 10% of cases. Above finding in our study is suggestive of chronic placental insufficiency as the main underlying mechanism of Oligohydramnios.

Antenatal complication, like preeclampsia if present in third trimester, it increases the possibility of development of Oligohydramnios .Hypoxia due to utero-placental insufficiency results in reflex redistribution of fetal cardiac output i.e. , renal and pulmonary blood flow decreases, leading to decreased urine production and hence decrease in amniotic fluid.

In our analysis, the Non reactive rates are high , 41 % and are comparable to Sriya R et al,^[13] who reported a 41.55% nonreactive NST; similarly Padmini CP et al,^[14] noted 40%; Kaur P et al,^[5] noted 38%; Kumar P et al,^[15] noted 40% of non reactive NST in their studies. Oligohydramnios can have a detrimental effect on fetal well being manifesting as non reactive non stress test. Thus NST can be taken as an adjunct to detect fetal distress in Oligohydramnios women.

Of all 819 women in our study, 236 women presented with Doppler study, out of which 29 showed abnormal Doppler study and 207 showed a normal Doppler study. When compared with perinatal outcome we found a significant association between Doppler study and perinatal outcome in term of birth weight (p value <0.00001); apgar score <7 in 1 min (p value 0.040621); NICU admission (p value 0.009761) suggesting that women with abnormal Doppler study were having poor perinatal outcome like low birth weight , apgar<7 in 1 min and NICU admission.

In our study we found that 35% of women were delivered by vaginal route and 74.9% underwent LSCS. Similarly, 32% of vaginal and 68% of LSCS was reported in Sowmya. K et al,^[16] P. Gaikwad et al,^[17] noted 26.6% of vaginal and 73.4% of LSCS; Mangal P et al,^[18] noted 24% vaginal and 76% LSCS; Purvi. P et al,^[19] noted 18.75% of vaginal and 81.25% of LSCS in their studies.

The rate of cesarean section was found to be high among women diagnosed with Oligohydramnios for better perinatal outcome at cost of increasing maternal morbidity to avoid the adverse effect in perinatal outcome. Occurrence of meconium stain liquor was 28% in our study which was similar to studies conducted by Sriya R et al,^[13] 38.88% and Chandra P et al,^[12] 23.7%. Meconium stain liquor was significantly associated with oligohydramnios in our study. Meconium –stained amniotic fluid is really matter of concern from both the Obstetricians and Pediatrician's point of view, as it causes intranatal asphyxia due to meconium aspiration Syndrome results in increase in neonatal intensive care unit admission.

Usually Oligohydramnios is proportional to the severity of placental hypo perfusion and IUGR (Fetal Growth Restriction). It is seen that women with Oligohydramnios are associated with increased likelihood of low birth weight babies. In our study 40.6% of babies were <2.5kg and we found birth weight was significantly associated with severity of Oligohydramnios (p value 0.001492). Similarly LBW reported by other studies such as Casey et al,^[17] were (61.53%), Sriya R et al,^[13] (58.38%), Kaur P et al,^[5] (60%), Dr G. Parthasaradhi Reddy et al,^[4] (48%), Umber A et al,^[18] (36.3%), Chate P et al,^[19] (62%).

The current study demonstrates that Apgar score is <7 in 1min in 37.8% and 20% babies had apgar <7 in 5 min. This finding is incongruent with other studies like Rutherford et al.^[20] where 23% had apgar <7 in 1min and 23% had <7 in 5min; Sriya R et al,^[13]

38.8% had apgar <7 in 1min and 9.7% had apgar <7 in 5min; This is reported to be due to head and cord compression and due to meconium stain liquor and explain the possible need for strict fetal surveillance in oligohydramnios. It was found that severity of oligohydramnios was significantly associated with Apgar <7 with P value 0.026283.

Our study reported that NICU admission was needed in 30.48% of babies with morbidity like birth asphyxia and meconium aspiration. With p value 0.000048 we found a significant association between severity of oligohydramnios and NICU admission indicating need of strict fetal surveillance in oligohydramnios. Similar to this, 23% in Shree lakshmi et al,^[6] 36% in Bhagat et al,^[21] 33% in Bachhav AA et al,^[22] 32% in Dr . Parthasaradhi Reddy et al,^[4] needed NICU admission.

In our studies there was 2.6% of neonatal death and this finding was in accordance with studies conducted by Radhamani S et al,^[23] 3.07%, Jeyamani B et al,^[24] 5.4%.

CONCLUSION

In our study we found significant correlation of oligohydramnios with low socioeconomic status, IUGR, pre eclampsia and post dated pregnancy. Once severe oligohydramnios is detected they have high rate of cesarean section with significant rate of fetal asphyxia leading to NICU admission. So, we recommend recognising the risks with careful monitoring to detect oligohydramnios early so that adverse fetal outcomes can be avoided.

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