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OLIGOHYDRAMNIOS IN TERM LOW-RISK PREGNANCY AND PREGNANCY OUTCOME

KEYWORDS: Amniotic fluid,amniotic fluid index,oligohydramnios

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ABSTRACT

Background : *Amniotic fluid is measured using amniotic fluid index. Oligohydramnios is defined as amniotic fluid index(AFI) of less or equal to five centimeters.*

Objective: *This study is undertaken to know the adverse pregnancy outcome in term low risk pregnancy with oligohydramnios.*

Methods: *This is a Cohort study done from Jan 2015 to Oct 2016 (22 months) at ASRAM , Eluru. It consists of analysis of pregnancy outcome in 50 cases with diagnosis of oligohydramnios by ultrasound after 37 completed weeks of gestation(Cohort 1) compared with 50 controls with no oligohydramnios (Cohort 2) and matched for other variables like age, parity, gestational age.*

Results: *There was significant difference between two groups in delivery by LSCS for fetal distress(p-<0.05) . There is increased incidence of labour induction in women with AFI ≤5cm than women with AFI >8cm. (p-0.04)*

Conclusion: *An amniotic fluid index of ≤ 5cm detected after 37 completed weeks of gestation is an indicator of poor pregnancy outcome. Determination of AFI can be used as an adjunct to other fetal surveillance methods. Determination of AFI is a valuable screening test for predicting fetal distress in labour requiring caesarean section.*

INTRODUCTION:

Amniotic fluid plays a major role in the fetal growth and development. It provides the fetus with a protective low resistance environment suitable for growth and development. It provides a cushion against the constricting confines of the gravid uterus, allowing the fetus room for the movement and growth and protecting it from external trauma. It helps to maintain the fetal body temperature and plays a part in the homeostasis of fluid and by permitting extension of the limbs it prevents joint contractures. It prevents compression of the umbilical cord and thus protects the fetus from vascular and nutritional compromise. In present practice, a semi quantitative amniotic fluid volume assessment during routine ultrasound examination and antepartum testing has become the standard of care.

The purpose of taking group of women with oligohydramnios at term pregnancies are because the etiology, management and the outcome is different in late onset oligohydramnios compared to early onset oligohydramnios. Amniotic fluid index of ≤5 cm defines oligohydramnios as, originally described by Phelan et al[1]. Many studies[2-5] show that oligohydramnios is associated with variety of ominous pregnancy outcomes, such as fetal distress, increased incidence of caesarean section, low birth weight, perinatal morbidity and perinatal mortality. However[6-8], some studies show that amniotic fluid index is a poor predictor of adverse outcome and even the existence of an entity like isolated term oligohydramnios has been questioned by some authors. Thus, this study is conducted to determine whether an antepartum amniotic fluid index (AFI) of 5 cm or less as a predictor of adverse pregnancy outcome.

OBJECTIVE OF THE STUDY: To determine whether an antepartum amniotic fluid index (AFI) of 5 cm or less as a predictor of adverse pregnancy outcome.

PATIENTS & METHODS:

This is a Cohort study done from Jan 2015 to Oct 2016 (22 months) at ASRAM , Eluru. It consists of analysis of pregnancy outcome in 50 cases with diagnosis of oligohydramnios by ultrasound after 37 completed weeks of gestation(Cohort 1) compared with 50 controls with no oligohydramnios (Cohort 2) and matched for other variables like age, parity, gestational age.Various outcome results were recorded and tabulated. The results were statistically analysed using parameters like mean, standard deviation and chi square test. In addition, epidemiological parameters like sensitivity, specificity, positive predictive value, negative predictive value were used.

INCLUSION CRITERIA :

1) AFI less than or equal to 5
2) Single live intrauterine gestation with cephalic presentation
3) 37 completed weeks of gestation
4) Intact membrane

EXCLUSION CRITERIA :

1)AFI more than 5
2)Gestational age less than 37 completed weeks.
3)Post term
4)Associated fetal malformations.
5)Ruptured membranes
6)Malpresentation and multiple gestations.
7)High risk pregnancy eg:

- Placental insufficiency
- Abruption
- Prostaglandin synthetase inhibitors therapy
- Angiotensinogen converting enzyme inhibitors therapy

8) Uterine scar due to previous LSCS, myomectomy, hysterotomy.

The pregnancies with fetal malformations were also excluded from the study. The cases in which amnioinfusion was done were also excluded from the study to avoid confounding outcome.

The management protocol was similar in both case group and control group.

- On admission,NST is done for all women in both case and control groups.
- If NST found reactive, then further management is done according to protocol and if non reactive Emergency LSCS done.
- If patient is in labour (ie less than 3 cm in primigravida and less than 4 cm in multigravida are included in study), oxytocin drip started.
- Women with oligohydramnios and women in control group with post dated pregnancy (less than 41weeks), if not in labour Bishops scoring done. Start oxytocin if cervix is favourable. Induce with Dinoprostone gel in case of unfavourable cervix .Reassess the Bishops score after 12 hrs of instillation. If in labour, start oxytocin drip. If not in labour watch for another 12 hrs. Case will be taken for emergency LSCS if no progress.
- All cases will be monitored by continuous electronic fetal

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monitoring in labour. Any signs of fetal distress emergency LSCS done.

- After 3cms dilatation of the cervical os in primigravida and 4 cms dilatation in multigravida ARM done and will be classified as clear and meconium stained liquor.
- Cases with meconium stained liquor will be taken for emergency LSCS. All newborns will be attended by Paediatrician.
- Various outcome measures recorded are induced vs spontaneous labour, nature of amniotic fluid, FHR tracings, mode of delivery, indication for caesarean section or instrumental delivery, APGAR score at 1 minutes and 5 minutes, birth weight, admission to neonatal ward, perinatal morbidity and mortality.

OBSERVATIONS AND RESULTS :

The maximum number of study group and control group belongs to the age group of less than 20 years. The mean age for study group was 22.54 years and that of control group was 22.24 years. There was no difference in the age distribution between two groups statistically.

The mean gravidity was 1.70 and 1.64 and mean parity was 0.5 and 0.48 respectively for cases and controls. Maximum numbers of patients were primigravidas in study group and in control groups gravida 2 patients were maximum. There exist statistical significant difference in both the groups. (p-0.04)

In study group maximum women were nulliparous as compared to control groups where in para 1 women are maximum. These observations are not statistically significant(p-0.17)

The mean gestational age was 38.56 weeks for study group and 39.36 weeks for control group which was similar. In study group 37 and 38 weeks of gestation groups constitute about 26% each. In control group many were 40 weeks of gestation(46%). There is statistical significance between the groups.(p-0.02)

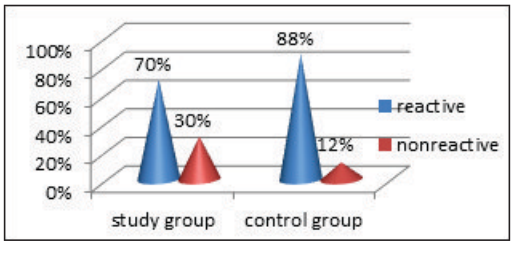
The amniotic fluid index was measured by four quadrant amniotic fluid volume assessment technique. The mean AFI for study group was 3.21 cm and for control group was 10.83 cm.

In study group 32% belongs have AFI between 4 - 5cm where as in controls 54% had AFI between 8 - 10 cms.

The outcome parameters analysed include non stress test, fetal heart rate decelerations on CTG, nature of amniotic fluid, induction rate, mode of delivery, occurrence of LSCS for fetal distress, APGAR score at 1 minute and 5 minutes, birth weight, admission to neonatal ward and perinatal mortality.

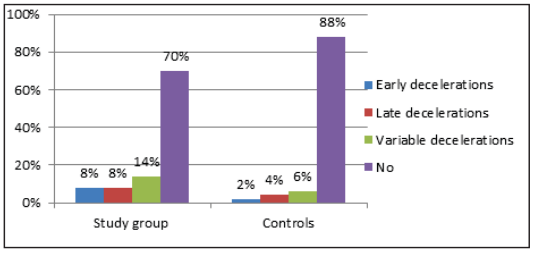
The NST was non reactive in 15 (30%) women with AFI $\leq$ 5 cm compared to only 6(12%) in control group. There was significant difference between two groups in occurrence of non reactive and reactive NST pattern. (p -0.02).

Graph showing distribution of study subjects based on Non tress test



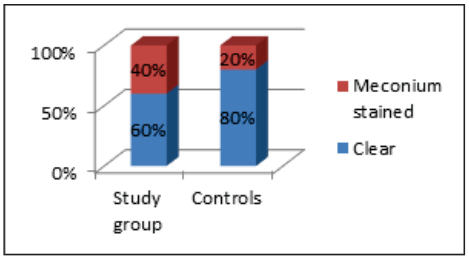
Most common FHR abnormality included variable decelerations found in 7(14%) woman in study group. Late deceleration in 4 (8%) of women of study group. In the control group fetal heart rate decelerations were found. However, these ominous FHR were seen in those women of control group who had an AFI in the lower range. There was no significant difference in two groups in occurrence of FHR decelerations statistically (p-0.16)

Graph showing distribution based on fetal heart rate pattern:



The amniotic fluid was meconium stained in 20 (40%)and clear in 30 (60%)women in study group. In control group, only 10(20%)women had meconium stained amniotic fluid and 40 (80%)had clear amniotic fluid. The difference in occurrence of meconium stained amniotic fluid between two groups was statistically significant.

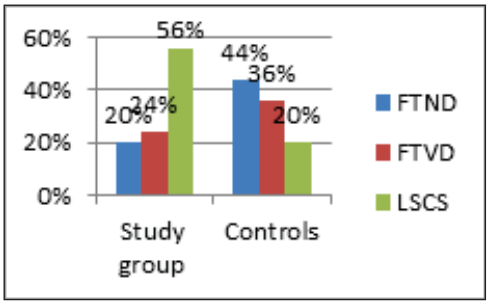
Graph showing distribution based on nature of amniotic fluid



The labour was induced in 28 (56%) women with AFI $\leq$ 5 cm and 18(36%) women with AFI > 8cm.In control groups 32(64%) delivered spontaneously. The decision for induction of labour was made depending upon gestational age and NST. Depending on CTG recording spontaneous labour was allowed. The difference between two groups in this category was statistically significant (p - 0.04).

Number of women delivered by LSCS was 28 (56.0%)among study group compared to 10 (20.0%) in control group. There was statistical significant difference among two groups in this category. (p<0.05)

Graph showing Distribution based on mode of delivery



The 5 min APGAR < 7 was seen in 4% in study group and 2% in control group. 8 neonates (16.0%)of study group were admitted toNICU for morbidities like birth asphyxia and meconium aspiration. 1 neonate (2.0%) of control group was admitted to neonatal ward. The difference in the two groups was statistically significant (p - 0.004)

Graph showing admission in NICU:

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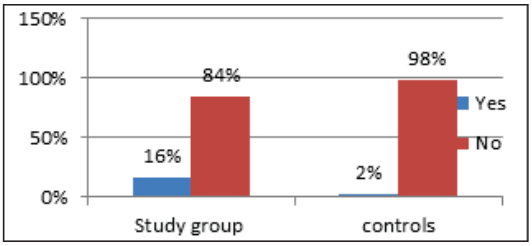
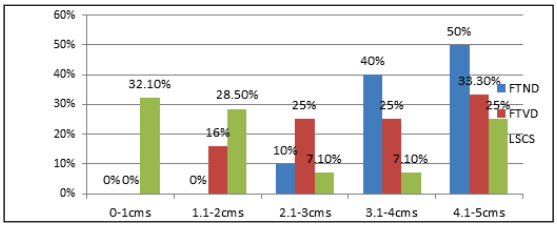


No neonatal deaths occurred in both study and control groups. Strict following of management protocol as mentioned before i.e, NST before induction, CTG monitoring in labour, timely interventions lead to zero mortality in study as well as control groups.

Maximum number of LSCS occurred in study group with AFI less than 1 ie 9 (32.1%). This observation is statistically significant (p-0.01). FTND in 5(50%) cases with AFI 4.1 - 5.0 cms and FTVD in 4 (33.4%)cases with AFI 4.1-5cm .

Graph showing relation between Amniotic Fluid index and mode of delivery:



DISCUSSION:

The various outcome results are compared with results of similar studies done both in India and abroad.

The mean gravidity in present study is 1.7 which is comparable to mean gravidity of 2 in study by Baron et al. The mean parity is 0.5 comparable that of mean parity of 1 in Baron. et al study and 0.6 in study by Magann et al.

The non reactive NST rates are high in women with AFI <5 cm. The rate of non reactive NST is 40%, 69.23%and 41% in studies conducted by Kumar P et al[11], Chandra et al[9], Sriya R[10] et al respectively. In present study 30% cases had non reactive NST comparable to that in similar study.

The FHR decelerations, during intrapartum period suggestive of fetal distress are common in pregnant women with AFI ≤ 5 cm. Most common are variable decelerations due to cord compression. The ominous FHR pattern noted in 30% in present study is comparable to 48% and 36.11% in studies by Casey et al[12]. and Sriya R. et al[10]. respectively.

The occurrence of meconium stained amniotic fluid is high in women with AFI ≤5 cm. The meconium stained liquor was noted in 40% in study group in present study which is comparably more than study conducted by Chandra P et al(23.7%).The studied by Rutherford et al[13] and Sriya R et al[10] had meconium stained liquor about 54% and 38.88% respectively . In a study by Grubb et al 99% of women with AFI ≤5 cm and prolonged deceleration, had meconium stained liquor. According our study protocol meconium stained liquor cases were taken up for emergency LSCS.

Various studies show different rates of LSCS for fetal distress in pregnant women with amniotic fluid index of ≤5 cm. The LSCS for fetal distress was done in 56% in present study which is compared with the situations in other studies. The LSCS rates were 76.92%,51%,43.93% respectively with study conducted by Chandra P et al[9], Casey et al[12], Sriya P et al[10]. Oligohydramnios (AFI ≤5 cm) has been used as a screening test for the development of fetal distress, subsequently during intrapartum period. Including only isolated oligohydramnios cases in our study may be the cause for decrease in LSCS rates for fetal distress compared to Chandra P et al.

The efficacy of oligohydramnios (AFI ≤5 cm) in predicting fetal distress and requirement of LSCS had a sensitivity of 73.6% and positive predictive value of 80%. But the specificity and negative predictive value were poor. So this can be considered as a screening test for occurrence of fetal distress in intrapartum period requiring cesarean delivery.

The rate of LSCS was more in those with oligohydramios and non reactive NST (100%). Even with reactive NST 37.1%develop fetal distress and LSCS was done. In control group women with non-reactive NST had 100% cesarean rate and with reactive NST had only 9% of cesarean rates

The 5 min APGAR score < 7 is seen in 4% of oligohydramnios group. Whereas 5 min APGAR less than 7 in other studies like Rutherford et al, Chandra P et al[9], Sriya R et al[10] are 23%, 23.07% and 9.72% respectively

Sixteen percent of newborns were admitted in neonatal ward for various morbidities like birth asphyxia, meconium aspiration etc. It is more when compared to studies conducted by Magann et al (7.6%) and Casey et al (7%). Among cases and controls there were no neonatal death. In Chandra P et [a9]. study neonatal death occurred in one case. In study by Baron et al. and Casey et al[12]. there was no mortality probably because of good neonatal intensive care unit facilities.In the control group (AFI 8-20 cm) 12% had non reactive NST. 20% had thick meconium stained liquor and 20% cesarean section rates, 2% NICU admissions.

CONCLUSION

- An amniotic fluid index of < 5 cm detected after 37 completed weeks of gestation in a low risk pregnancy is an indicator of poor pregnancy outcome.
- In our study the rate of LSCS, meconium stained liquor, non reactive NST, abnormal FHR tracing during labour, development fetal distress, NICU admission are more. But except abnormal FHR tracing ,in rest all parameters statistical significant difference exist between study and control groups.
- Determination of AFI can be used as an adjunct to other fetal surveillance methods.
- Determination of AFI is a valuable screening test for predicting fetal distress in labor requiring cesarean section. It has a sensitivity of 73.6% and negative predictive value of 80% specificity of 64.5% and positive predictive value of 56%.

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