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Original article

Comprehensive study of perinatal outcome in pregnancy more than 36 weeks with AFI <8

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ABSTRACT

Background: Oligohydramnios with AFI <8 cm can lead to an increase in perinatal mortality and morbidity. Under these conditions, there is increased frequency of meconium stained liquor, fetal distress, low apgar scores, abnormal fetal heart rates.

Aims and Objectives: To assess the perinatal outcome in pregnancy more than 36 weeks with AFI <8 and to compare the perinatal outcome in pregnancies more than 36 weeks with AFI >8cm.

Material and Methods: Present prospective study was conducted on perinatal outcome in pregnancy more than 36 weeks gestation with AFI <8cm and control group AFI >8 cm. A total of 100 women were included in the present study which were divided into 2 groups of 25 each and 50 controls. 1. Pregnant women more than 36 weeks with AFI <8 cm 2. Pregnant women more than 36 weeks with AFI >8 cm.

Results: 44% of neonates admitted in NICU in study group 2 and only 10% neonates admitted in NICU in control group (p <0.001). 12% of neonates died in study group and only 2% died in control group. In the study group 40% babies had reactive NST and 60% had non reactive NST. 16% babies died among nonreactive NST. In controls 49% babies had reactive NST and only 2% had nonreactive NST. 2% babies died among non reactive NST (p<0.001). In the study group 2, 48% babies had reactive NST and 52% had non reactive NST. 8% babies died among nonreactive NST. In controls 98% babies had reactive NST and only 2% had nonreactive NST. 2% babies died among non reactive NST.

Conclusion: Study concluded that pregnancy with AFI <8cm is a high risk pregnancy and proper antepartum care, intensive fetal surveillance and intrapartum care are required in these patients. Every case with AFI <8cm needs careful antetal evaluation, parental counseling, individualization, decisions regarding time and mode of delivery.

Keywords: Perinatal outcome, Pregnancy, 36 weeks, AFI <8

INTRODUCTION

The amniotic fluid is a clear, slightly yellowish liquid that surrounds the unborn foetus during pregnancy. It is surrounded by amniotic cavity. Its floor is formed by the ectoderm and the rest of its wall by primitive mesenchyma.

The water in the amniotic fluid is completely changed and replaced every 3 hours. Foetal swallowing is the primary mechanism for amniotic fluid resorption and averages 500 to 1000 ml per day, however that does not remove the entire amniotic fluid and other mechanisms like transmembranous flow across amniotic membrane, intramembranous flow across foetal vessels on the placental surface and flow across foetal skin account for a smaller proportion of fluid transport in second half of pregnancy. Amniotic fluid index (AFI) assessment was proposed by Phelan.[1] The uterus is arbitrarily divided into four quadrants by the umbilicus transversely and the linea nigra vertically. The largest vertical pocket free of foetal parts and loops of cord in each quadrant is added to give the AFI. An AFI of 5-18 is considered normal. Phelan described oligohydramnios as an AFI less than 5 but

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later Jeng et al proposed a cut off of 8 cm demonstrating increased incidence of meconium staining, cesarean delivery for foetal distress, abnormal foetal heart rate pattern and Apgar score of 7 or less than 7 at one minute when AFI was less than 8.[2]

Phelan and Baron et al observed no difference in meconium staining of amniotic fluid, cesarean delivery for foetal distress, birth weight less than 2500 g, 5 minute Apgar score less than 7 or the number of neonates admitted in NICU between pregnancies with borderline AFI compared to normal pregnancies.[2,3] Oligohydramnios is defined as a condition where the liquor amnii is deficient in amount to the extent of less than 200 ml at term. Sonographically, it is defined when the maximum vertical pocket of liquor is less than 2 cm or when AFI is less than 5 cm (less than 5 percentile). AFI between 5 and 8 cm is termed as borderline AFI or borderline oligohydramnios. Absence any measurable pocket is called anhydramnios.

AFI 8-24 cm is considered normal. The incidence of oligohydramnios varies between 0.5 to >5%. Umbilical cord compression during labour is common with oligohydramnios which increases the risk for cesarean delivery for fetal distress and 5 minute apgar score <7.[4] The disease of amniotic fluid volume is associated with still birth, increased labour induction meconium aspiration syndrome, non reassuring fetal heart pattern and neonatal death.[5] The present study was undertaken to assess the perinatal outcome in pregnancy more than 36 weeks with AFI <8 and to compare the perinatal outcome in pregnancies more than 36 weeks with AFI >8cm.

MATERIALS AND METHODS

Present prospective study was conducted on perinatal outcome in pregnancy more than 36 weeks gestation with AFI <8cm and control group AFI >8 cm, in the Department of Obstetrics and Gynaecoogy, Patna Medical College and Hospital, during the period of November 2016 - October 2018. Ethical clearance was obtained for this study from the institution.

Pregnant women more than 36 weeks with AFI <8cm compared with pregnant women more than 36 weeks with AFI >8cm attending labour room during the study period. A total of 100 women were included in the present study which were divided into 2 groups of 50 each.

1. Pregnant women more than 36 weeks with AFI <8 cm
2. Pregnant women more than 36 weeks with AFI >8 cm

Women with singleton pregnant with gestational age >36 weeks, AFI <8cm, intact membranes, without congenital anomalies were included in the study.

Women with singleton pregnancy with gestational age <36 weeks, women with fetus having congenital anomalies like renal agenesis, polycystic kidney disease, ruptured membranes or leaking, polyhydramnios were excluded from the study.

All the patients included in the study were subjected to examination viz. name, age, address, registration number, occupation, presenting complain, menstrual history, obstetric history, personal history, past medical and surgical history and family history.

General examination included pallor, icterus, cyanosis, tongue, teeth, gum, thyroid lymph node, breast examination pulse, blood pressure weight, height and BMI were noted.

Systemic examination included cardiovascular examination and respiratory system examination. Obstetric examination included per abdomen examination - symphysiofundal height, lie, presentation, foetal heart rate, per speculum examination, per vaginum examination - cervix dilatation, effacement membranes present or absent.

Routine investigations such as Hb, ABORh, VDRL, blood sugar, urine, BT, CT, TLC, DLC, HIV, HbsAg, HCV, USG and NST etc. were carried out in all the patients.

After taking informed consent patients were treated. Iron, calcium, and multi vitamin supplements were continued orally as before. AFI measurements was done. These women were followed till discharge.

Duration of delivery by vaginal route or elective/emergency LSCS was done as required. Some patients were already in labour and others allowed to go into spontaneous labour. Some were induced. If delivery is made by cesarean section, the indication was recorded.

Various outcome such as CTG changes, mode of delivery, presence of meconium, Apgar score at 1 minute and 5 minute were observed.

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Primary outcome viz. fetal distress as defined by any one or more of the following criteria.

- Recurrent variable deceleration
- Late deceleration
- Prolonged bradycardia
- Apgar score 7 at both 1 and 5 minutes
- Secondary outcome included:
- Mode of delivery - vaginal delivery or cesarean delivery for foetal distress
- Meconium staining of amniotic fluid
- NICU admission

Methodology

An ultrasound examination was done to monitor fetal well being and assess amniotic fluid index and it was measured by Phelan's technique.

A curvilinear transducer was used. The uterus was divided into four equal quadrants - the right and left upper and lower quadrants respectively through the maternal midline vertically and an arbitrary transverse line between symphysis pubis and upper edge of uterine fundus.

Transducer placement was parallel to maternal sagittal plane and perpendicular to maternal coronal plane.

Image frozen at the clear deepest pocket of amniotic fluid. This pocket was measured using ultrasound calipers in a vertical direction. It is repeated in each of the four quadrants and summation of the four values gives AFI. Patients were grouped according to their AFI, study group with AFI <8 cm and control group with AFI >8 cms.

Statistical analysis

At the end of the study, the data was collected and analaysed statistically. Chi-square test was used to calculated qualitative data. A p value of <0.05 was considered as significant.

RESULTS

In the present study, most of the patients in both the groups were between 20-30 years. A total of 19(76%) were in study group and 40(80%) were in Control group (p >0.05 NS). Maximum patients in study group were from upper lower class and control group were from upper class i.e. 15(60%) and 20(40%), respectively (p=0.007). In study group 2, maximum patients were from upper lower class and control group were from middle class (p 0.081).

Maximum patients were primigravida in both study groups. A total of 15(60%) patients in study group and 30(60%) in control group had parity G1. A total of 3(12%) in study group and 4(8%) in control group had parity G4 (p=0.90, NS), Most patients in study group delivered by 37 weeks but patients in control delivered at 38 completed weeks. In study group 2, most patients delivered at 37 weeks but patients in control group delivered at 38 completed weeks and after 38 weeks comparative more pregnancies were continued till term in controls. Most pregnancies were uncomplicated in both study and control group. In study group 1 preeclampsia was 16%, chronic hypertension was 8% IUGR was 32%. In control group preeclampsia was 0%, chronic hypertension was 14%, IUGR was 6%. Statistical analysis found to be significant (p 0.0002).

In study group 2 preeclampsia was 12%, chronic hypertension was 4% IUGR was 28%. In control group preeclampsia was 0%, chronic hypertension was 14%, IUGR was 6%. Statistical analysis found to be significant (p 0.001). The reaction NST was found in 98% in control group and only 40% in study group. The nonreactive NST was 60% in study group and 2% in control group (p <0.0001). In study group 2, the reaction NST was found in 98% in control group and only 48% in study group. The nonreactive NST was 52% in study group and 2% in control group (p <0.0001). Labour occurred spontaneously in 78% in control group and 64% in study group. Labour was induced in 36% in study group and 22% in control group (p >0.05, NS). In study group 2, Labour occurred spontaneously in 78% in control group and 68% in study group. Labour was induced in 32% in studsy group and 22% in control group (p >0.05, NS).

Liquor was thick meconium stained in 48% and thin meconium stained in 28% in study group. Liquor was thick meconium stained in 10% and thin meconium stained in 4% in controls (p <0.001). In study group 2, Liquor was thick meconium stained in 40% and thin meconium stained in 28% in study group. Liquor was thick meconium stained in 10% and thin meconium stained in 4% in controls (p <0.001).

Majority of deliveries in study group were LSCS (80%) and vaginal delivery was 20%. In control group vaginal delivery was in 76%, instrumental delivery was 4% and LSCS was 20% (p <0.001). In study group 2, majority of deliveries in

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study group were LSCS (60%) and vaginal delivery was 36% and 4% instrumental deliveriy. In control group vaginal delivery was in 76%, instrumental delivery was 4% and LSCS was 20% (p <0.001).

Among the study group the most common indication for LSCS was fetal distress (80%). In control group only 30% patients underwent LSCS due to foetal distress (p <0.001). In study group 2, the most common indication for LSCS was fetal distress (73.33%). In control group only 30% patients underwent LSCS due to foetal distress (p <0.001). Apgar score was above 7 in 96% of control group and only 56% in study group (p <0.001). In study group 2, Apgar score was above 7 in 96% of control group and only 72% in study group (p <0.001).

Study group showed that 32% of neonates were below 2 kg and no case of the birth weight below 2kg was found in control group (p <0.001). In study group 2 20% of neonates were below 2 kg and no case of the birth weight below 2kg was found in control group (p <0.001). 64% of neonates admitted in NICU in study group and only 10% neonates admitted in NICU in control group (p <0.001). 44% of neonates admitted in NICU in study group 2 and only 10% neonates admitted in NICU in control group (p <0.001). 12% of neonates died in study group and only 2% died in control group. IUGR neonates were 12% in study group and only 2% in control (<0.001). 16% of neonates died in study group and only 2% died in control group. IUGR neonates were 8% in study group and only 2% in control (<0.001). In the study group 40% babies had reactive NST and 60% had non reactive NST. 16% babies died among nonreactive NST. In controls 49% babies had reactive NST and only 2% had nonreactive NST. 2% babies died among non reactive NST (p<0.001). In the study group 2, 48% babies had reactive NST and 52% had non reactive NST. 8% babies died among nonreactive NST. In controls 98% babies had reactive NST and only 2% had nonreactive NST. 2% babies died among non reactive NST.

DISCUSSION

Oligohydramnios with AFI <8 cm can lead to an increase in perinatal mortality and morbidity. Under these conditions, there is increased frequency of meconium stained liquor, fetal distress, low apgar scores, abnormal fetal heart rates. Compared to control group, there was a two fold increase in neonatal and fetal acidosis.[6] There was a threefold increase in cesarean section for fetal distress compared to control. In this study, there was 50 cases in the study group with AFI <8cm which was divided into two groups each having 25 cases. There were 50 cases in control group with AFI >8 cm. In present study, most patients were in the age group of 20-30 years. Mean age in study group (AFI 0-5 cm) was 23.72 years and control (AFI >8cm) was 24.48 years (p >0.05, NS).

Most patients were in the age group of 20-30 years. Mean age of study group 2 (AFI <5->8cm) was 23.8 years and mean age of control (AFI >8cm) was 24.48 years (p >0.05, NS). Most patients in the study group (AFI 0-5 cm) belonged to upper lower class and control group (AFI >8cm) belonged to middle class. Maximum patients in study (AFI >5-<8cm) belonged to upper lower class. Patients in control group belonged to middle class (p >0.05, NS). Maximum patients in study group 1 (AFI 0-5 cm) and study group 2 (AFI >5-<8cm) as well as control (AFI >8cm) were primigravida. Incidence of oligohydramnios was more common in primigravida which was comparable with the study of Petrozella et al.[7] Maximum patients in study group 1 and study group 2 delivered around 37 weeks due to more incidence of foetal distress. Patients in control group continued pregnancy upto term and delivered by 38-40 weeks. In study group 1 had more incidence of preeclampsia 16%, IUGR 32%, chronic hypertension 8% as compared to control which had 14% chronic hypertension, 6% IUGR and 80% uncomplicated pregnancy. Study group 2 had 12% cases of preeclampsia, 4% chronic hypertension and 28% IUGR. Chandra et al[8] and Sriya et al[9] recorded 44% incidence of preeclampsia in oligohydramnios. Study group 1 had 60% patients nonreactive NST and control had only 1% non reactive NST. Study group 2 had 52% non reactive NST. Chandra et al[8] reported 69.23% NST. In study group 1, 36% of patients were induced and 64% spontaneously go in labour as compared to control group which only 22% patients were induced and 78% had spontaneous labour. In study group 2, 32% patients had induced labour and 68% has spontaneous onset of labour. Casey et al[5] study reported 42% induced patients.

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Liquor was thick meconium stained in 48% of patients with AFI 0-5 cm as compared to those with AFI >8cm in which only 10% patients has thick meconium in liquor.

Liquor was thick meconium stained in 40% of patients in study group 2 as compared to control (10%). Sriya et al[9] reported 38.88% patients with thick meconium stained. In study group 1, 80% of patients underwent LSCS due to foetal distress. In control group only 10% had LSCS. In study group 2 60% of patients underwent LSCS.

The most common indication of LSCS in study group was foetal distress 80%. In control group only 30% foetal distress noted. In study group 2, 73% of patients underwent LSCS due to foetal distress. Casey et al reported 51% foetal distress.[5] Apgar score less than 7 seen in 44% of study group 1. In control 4% of neonates had apgar less than 7. In study group 2, 28% of neonates had Apgar less than 7.

In study group 1, 60% of neonates had birth weight less than 2.5 kgs. In control group, 22% of neonates has birth weight less than 2.5 kg. In study group 2, 22% neonates had birth weight less than 2.5 kg. Sriya et al reported 58.38% neonates with less than 2.5 kg birth weight.[9] 64% neonates in study group 1 and 44% in study group 2 required NICU admission as compared to control in which only 10% neonates admitted to NICU. Sriya et al reported 88% NICU admission.[9] In study group 1 12% neonates died due to IUGR, 4% due to respiratory distress syndrome and 1% due to jaundice. In study group 2, 8% neonates died due to IUGR, 4% due to respiratory distress syndrome and 4% due to jaundice. In control group, 2% neonates died due to IUGR. Casey et al reported 5% neonates death.[5] In study group 1, 60% patients had nonreactive NST and 40% has reactive NST. 16% neonates died in patients of nonreactive NST. In study group 2, 48% of patients had reactive NST and 52% patients has nonreactive NST, 8% neonates died in patients of non reactive NST. In control group, 98% patients had reactive NST and 2% had nonreactive NST, 2% neonates died in patients of nonreactive NST.

CONCLUSION

Cases with AFI <8cm is being detected more often these days due to routinely performed USG for foetal well being. AFI <8 cm is one of the indicators of poor perinatal outcome. It is associated with fetal heart rate decelerations, meconium staining of amniotic fluid, umbilical cord compression, poor tolerance of labour, low Apgar score and fetal acidosis. Pregnancy induced hypertension and chronic placental insufficiency are the commonest causes of reduced amniotic fluid during third trimester of pregnancy. Oligohydramnios with reactive NST is associated with good prognosis. Oligohydramnios with nonreactive NST needs careful monitorin and results in early delivery, increased incidence of caesarean delivery for fetal distress, NICU admission, low Apgar score at 5 minutes and perinatal death. Mode of delivery depends on severity of oligohydramnios and status of fetal well being. Cesarean section is mostly required for cases with both severe and borderline oligohydramnios with intrapartum fetal heart abnormalities. Foetus are relatively more prone for certain complications like intrapartum fetasl distress, MAS and birth asphyxia. Study concluded that pregnancy with AFI <8cm is a high risk pregnancy and proper antepartum care, intensive fetal surveillance and intrapartum care are required in these patients. Every case with AFI <8cm needs careful antetal evaluation, parental counseling, individualization, decisions regarding time and mode of delivery. Oligohydramnios with AFI <8cm is associated with more maternal and fetal complications than AFI >8cm-<8cm. Continuous intrapartum foetal monitoring and good neonatal care are necessary for better perinatal outcome.

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