

The Study on Amniotic Fluid Index in Postdated Pregnancy and Its Perinatal Outcome in a Tertiary Care Center

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Abstract:

BACKGROUND:

The aquatic environment of the fetus has long remained a mystery to the patient and obstetricians, and the precise origin of the amniotic fluid is still not completely understood. Oligohydramnios is described as a condition with decreased amniotic fluid relative to gestational age. Its incidence is 2.3% .The incidence increases,upto 11% in postdated pregnancies. Assessment of amniotic fluid volume(AFI) by ultrasonogram is reliable. Decreased liquor are associated with increased incidence of meconium –stained liquor and abnormal fetal heart rate patterns during labour, thereby increasing operative deliveries. Thus this study was conducted to find the significance of amniotic fluid index in determining the maternal and perinatal outcome in pregnant women who came postdated to our department admitted, and evaluated to find out the maternal and fetal outcome with regards to amniotic fluid index in those patients.

STUDY DESIGN: Prospective study

PERIOD OF STUDY: 1YEAR

METHODOLOGY:

Patients admitted in Government Mohan Kumaramangalam Medical College, Salem, between January 2017 and December 2017, who fulfilled the inclusion and exclusion criteria. Decreased liquor are associated with increased incidence of meconium –stained liquor and abnormal fetal heart rate patterns during labour, thereby increasing operative deliveries. Thus this study was conducted to find the significance of amniotic fluid index in determining the maternal and perinatal outcome in pregnant. About 300 antenatal women whose gestational age is >40 weeks were included in the study.

RESULTS:

By this study we are able to predict the perinatal outcome by assessing AFI using ultrasonogram which is a simple bedside noninvasive investigation being done for all antenatal patients to identify at risk patients who needs further careful monitoring intrapartum. Overall the perinatal morbidity and mortality is markedly increased in patients with oligohydramnios in postdated pregnancies. Determination of AFI must be used as an adjunct to other fetal surveillance methods. By proper early third trimester assessment,we easily identify patients who need more care and early termination is done in case of oligohydramnios ,thereby avoiding the rate of postdated pregnancy admissions and unnecessary caesarean section.

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I. Introduction:

Oligohydramnios is described as a condition with decreased amniotic fluid relative to gestational age. Its incidence is 2.3% .The incidence increases,upto 11% in postdated pregnancies. Assessment of amniotic fluid volume(AFI) by ultrasonogram is reliable. It is calculated as the sum of deepest vertical pocket in each quadrant of the uterus. Manning et al.,defined oligohydramnios as the condition when the largest pocket on ultrasound in its broadest diameter measured < 1cm. Subsequently they revised the criteria to single pocket measuring 2cm in both vertical and horizontal planes.Phelan et al.,described amniotic fluid index by USG and explained that oligohydramnios is a condition when amniotic fluid index (AFI) was <= 5cm. But later Jeng et al., proposed a cut-off as 8 cm demonstrating increased incidence of meconium staining ,caesarean delivery for fetal distress, abnormal fetal heart rate pattern and Apgar scores of 7 or less at one minute when AFI was < 8 cm. Oligohydramnios is associated with increased maternal morbidity ,increased rate of induction of labour and caesarean section. It is also associated with adverse perinatal outcomes such as preterm delivery, low birth weight, fetal distress ,meconium passage, low APGAR score, neonatal resuscitation and NICU admission. Oligohydramnios can also be an idiopathic finding in a woman who had low risk pregnancies and no medical or

fetal complication. The long term sequelae of oligohydramnios is pulmonary hypoplasia, potter's syndrome, club foot, club hand and dislocation of hip. During labour, the predominant mechanical function of amniotic fluid is to provide a cushion for the umbilical cord, without which there would be compression of the cord during labour.

II. Aims And Objectives:

The aim of this study is to study the role of AFI in postdated pregnancies thereby helping us to know the various perinatal morbidities associated with it, so as to increase the perinatal outcome by creating awareness among the antenatal women, AFI evaluation and vigilant intrapartum monitoring for this group of antenatal women who turn up postdated to the tertiary care center.

In this study we compare various factors found to be in significant association with the amniotic fluid index in postdated pregnancies thereby increasing the perinatal outcome.

III. Materials And Methods:

- **SOURCE OF DATA:** Patients admitted in Government Mohan Kumaramangalam Medical College, Salem, between January 2017 and December 2017, who fulfilled the inclusion and exclusion criteria
- **SAMPLE SIZE:** About 300 antenatal women whose gestational age is >40 weeks
- **PLACE OF STUDY:** Government Mohankumaramangalam Medical College, Tamilnadu, Salem.
- **PERIOD OF STUDY:** January 2017-December 2017 (1 year)
- **'CONSENT:** Written informed consent from the patient
- **ETHICAL CLEARANCE:** Nil
- **CONFLICT OF INTEREST:** Nil
- **FINANCIAL SUPPORT:** Nil
- **INCLUSION CRITERIA:**

Pregnant woman in age group of 18-35 yrs with

- 1) single live intrauterine gestation
- 2) cephalic presentation
- 3) gestational age >40 completed weeks
- 4) intact membrane
- 5) who have given written informed consent to participate in this study

- **EXCLUSION CRITERIA:**

- 1) ruptured membranes
- 2) amnioinfusion
- 3) multiple gestation
- 4) gestational age <40 completed weeks
- 5) associated fetal malformations
- 6) high risk pregnancies like hypertension, diabetes, chronic renal disease, preeclampsia, connective tissue disorders
- 7) abruption
- 8) PG synthetase inhibitors & ACE inhibitors therapy

Postdated pregnant patients fulfilling my inclusion and exclusion criteria were admitted. Detailed history were obtained from the patient about the socioeconomic status, booked / unbooked, the patient's age, obstetric code, gestational age, menstrual history, obstetric history. Obstetric examination carried out. Symphysio-fundal height measured. Fetal heart rates was recorded serially. It is reasonable to start antenatal surveillance between 41-42 weeks of gestation despite lack of evidences it improves the outcome. No single method has been recommended as superior in making of fetomaternal outcome. Blood investigations – hemoglobin, blood grouping and typing, cell counts, blood sugar, urine analysis, VCTC, VDRL, USG, Doppler, CTG were done. Per Speculum and per vaginal examination was done to rule out draining per vaginum and confirmed intact membranes. After taking informed consent from the patients, AFI was measured ultrasonographically and for each case continuous CTG tracing was monitored. These women were followed till discharge.

Ultrasound examination to monitor fetal wellbeing and assess amniotic fluid index is done by Phelan's technique in which a curvilinear transducer was used. The abdomen was divided into four equal quadrants 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 is frozen at the clear deepest pocket of amniotic fluid. This pocket was measured in a vertical direction. It is repeated in each of the four quadrants and summation of the four values gives the AFI of that patient and they are grouped according to their AFI. Decision of delivery route was done as required. Some

patients were already in spontaneous labour, some were subjected to induction of labour. If delivery is by caesarean section, the indication was recorded.

A study proforma was filled for each case. During delivery the colour of liquor was observed .APGAR of the baby was recorded at 1 minute and 5 minute. Birth weight of the baby recorded. The rate of NICU admission is recorded. The perinatal outcome is followed up for 28 days after delivery.

IV. Results:

Our study mainly aims at identifying the causes of maximum number of postdated patients getting admitted in order to reduce the incidence of oligohydramnios associated with it which is the main cause of increased NICU admissions and adverse perinatal outcome identified during the followup of these babies.

Our study encompassed a total of 300 postdated antenatal women who fulfilled the inclusion and exclusion criteria and they were classified based on their AFI found using ultrasonogram. Various factors like socioeconomic status, age, parity, mode of induction of labour, CTG, colour of liquor, mode of delivery, caesarean section rate and the indication for LSCS,APGAR and weight of the baby, NICU admission rate and the final outcome of each baby delivered were followed up. These factors were tabulated and percentage of each calculated and compared with each factor which affects the perinatal outcome of a baby born to a postdated women. The significance rate was also calculated for each variable using the Chi Square test.

TABLE-1 SOCIOECONOMIC STATUS AND PERCENTAGE IN OUR STUDY GROUP

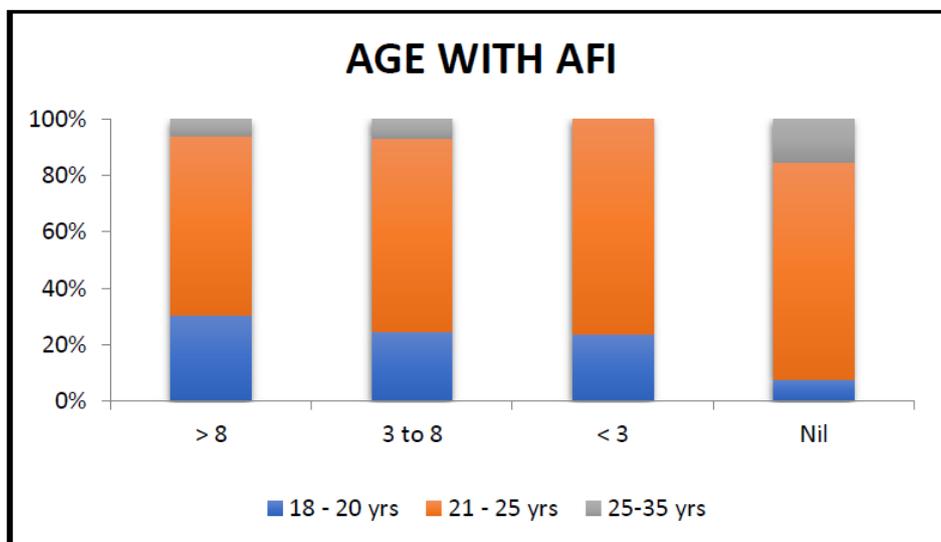
SOCIOECONOMIC STATUS	FREQUENCY	PERCENTAGE
II	12	4.0
III	125	41.7
IV	106	35.3
V	57	19.0
TOTAL	300	100.0

TABLE 2-PERCENTAGE OF GESTATIONAL AGE IN WEEKS

GESTATIONAL AGE	FREQUENCY	PERCENTAGE
40-41 WEEKS	220	73.3
41-42 WEEKS	62	20.7
>42 WEEKS	18	6.0
TOTAL	300	100.0

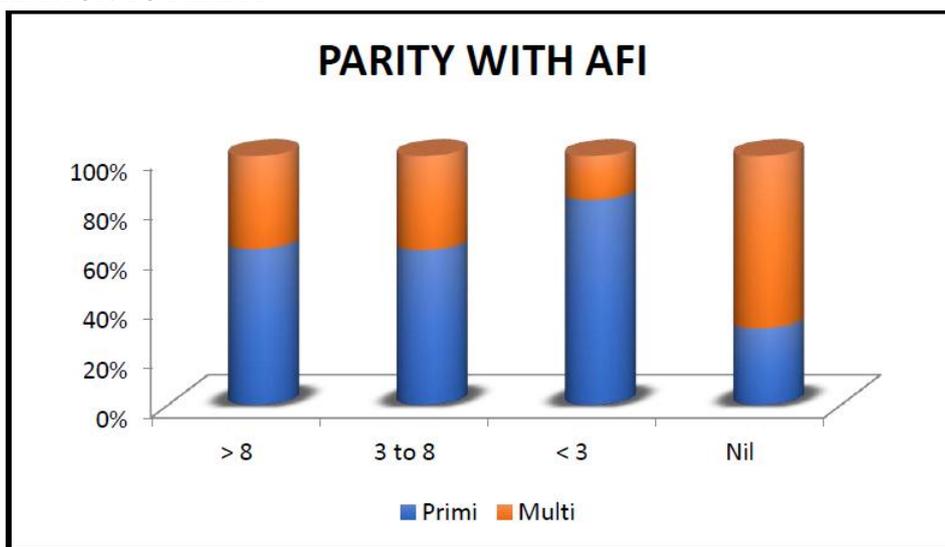
In our study, maximum number of postdated women 73.3% falls between the gestational age of 40-41 weeks ,followed by 20.7% coming between gestational age of 41-42 weeks and 6% from the gestational age of >42 weeks.

RELATION BETWEEN AFI AND MATERNAL AGE



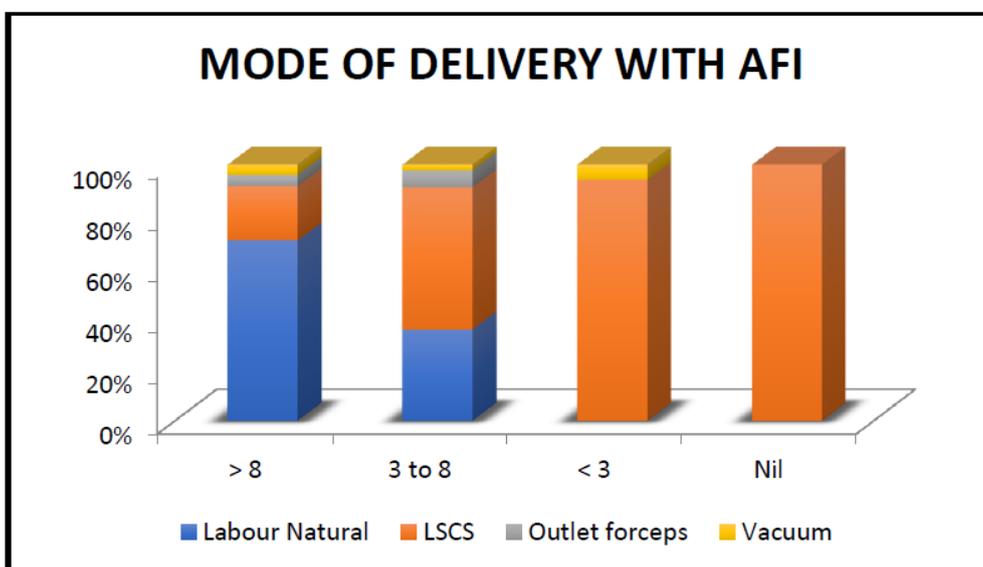
In our study, maximum number of antenatal women- 66% (198 out of 300 postdated women) were in the age group of 21-25 years indicating that postdated women were mostly in the younger age group and 76.9% of them had anhydramnios ,76.5% had AFI < 3, 68.9% with AFI 3 to 8, and 64% with AFI > 8. The mean maternal age was 23.21 years.

AFI IN RELATION TO PARITY



In our study, 62.3% of postdated women fell under the primigravida group, while only 37.7% comes under the multigravida group. Maximum number of postdated primigravida (82.4%) had AFI < 3, and maximum of postdated multigravida women (69.25%) had AFI-NIL.

RELATION BETWEEN AFI AND MODE OF DELIVERY



174 out of 300 antenatal women (58%) delivered by labour natural while 102 out of 300 (34%) women delivered by LSCS. In AFI > 8, almost 70.2% delivered by labour natural, In AFI < 3 nearly 94.1% delivered by Lower segment caesarean section.

13 out of 300 (4.3%) antenatal women delivered by outlet forceps, while 11 out of 300 (3.7%) antenatal women delivered by ventouse /vacuum delivery. High significance of P value 0.0005 was present between mode of delivery and AFI by Chi Square test.

RELATIONSHIP BETWEEN AFI AND FETAL PARAMETERS:

272 out of 300 antenatal postdated women (90.7%) gave birth to babies of weight 2.5 to 4 kg, and 28 out of 300 women (9.3%) gave birth to < 2.5 kg babies out of which 38.5% of babies were in anhydramnios group, 11.8% were in AFI < 3 group, 11.1% were in AFI 3 to 8 group, and 7.1% of them had AFI > 5. By Chi Square test, there was high significance between AFI in postdated pregnancy and birth weight of the baby and the P value is 0.0002. IUGR or Fetal Growth Restricted Babies were mostly associated with oligohydramnios in postdated pregnancies. Anomalies are more common among this group. The APGAR at 1 minute and 5 minutes

of every baby delivered to postdated antenatal women at labour ward is observed. Paediatrician opinion called over beforehand for all cases in order to reduce the rate of adverse perinatal outcomes.

It was observed that when AFI is > 8 , 91.6% of babies had APGAR values > 7 , but when AFI is reduced grossly or in anhydramnios the incidence of APGAR < 7 increases to 92.3%

240 out of 300 babies of postdated women (80%) had APGAR values of > 7 at 1 and 5 minutes, while 60 out of 300 babies of postdated women (20%) had APGAR values of < 7 at 1 and 5 minutes respectively. 92.3% in anhydramnios group were admitted to NICU. 58.8% from AFI < 3 group, 42.2% from AFI 3 to 8 group, 9.8% from AFI > 8 group were admitted to NICU. All babies admitted to NICU required effective resuscitation.

In our study, 3 babies went in for neonatal death. Two of them was due to birth asphyxia/hypoxic encephalopathy, one neonatal death was due to Fetal growth restriction/sepsis. Thus the gross perinatal mortality in our study was 3 out of 300 babies born to postdated women .

V. Conclusion:

By this study we are able to predict the perinatal outcome by assessing AFI using ultrasonogram which is a simple bedside noninvasive investigation being done for all antenatal patients to identify at risk patients who needs further careful monitoring intrapartum. Overall the perinatal morbidity and mortality is markedly increased in patients with oligohydramnios in postdated pregnancies. Determination of AFI must be used as an adjunct to other fetal surveillance methods. By proper early third trimester assessment, we easily identify patients who need more care and early termination is done in case of oligohydramnios ,thereby avoiding the rate of postdated pregnancy admissions and unnecessary caesarean section. AFI is a predictor of fetal tolerance in labour and its decrease is associated with increased risk of abnormal heart rate and meconium stained fluid.

This is overcome by assessing AFI through ultrasonogram at the earliest in third trimester, biophysical profile scoring, and proper intrapartum fetal heart rate monitoring. Hence this study helped greatly in knowing the significant association between advanced gestational age and oligohydramnios.

Thus the time and mode of induction and delivery in these cases depends on the severity of oligohydramnios and the status of fetal well being which is best assessed by ultrasonogram and fetal heart rate monitoring .

This helps in decreasing the perinatal morbidity and mortality due to oligohydramnios in postdated pregnancies. We must be able to achieve this right from antenatal counselling and evaluation and individualised decision regarding the timing and mode of delivery which helps in reducing the rate of caesarean section thereby helping in a better perinatal and maternal outcome.