



ORIGINAL RESEARCH PAPER

Obstetrics

PERINATAL OUTCOME OF FOETUSES WITH ABSENT END DIASTOLIC FLOW ON UMBILICAL ARTERY DOPPLER

KEY WORDS: Absent end diastolic flow, IUGR, Perinatal mortality, Still birth, Neonatal death

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ABSTRACT

A retrospective cohort study of 76 pregnant women diagnosed with fetuses with absent end-diastolic flow (AEDF) on umbilical artery Doppler was carried out at a tertiary care teaching Institute in South India to find out the causes of AEDF and perinatal outcome. The majority of women were young primigravidae with a mean age of 28.5 years. Medical disorders complicating pregnancy are the common etiological factors for AEDF among which hypertension complicating pregnancy was the commonest (46%). In 19% the cause was unexplained. The gestational age at diagnosis was between 30 to 32 weeks in majority (35.5%) followed by 32+1 to 34 weeks in 21%. Induction of labour was undertaken in 31% and among these 50% required emergency Caesarean for fetal distress and the mean birth weight was 1378 gms. Elective Caesarean section was performed in 9.2% and the mean birth weight was 1467 gms. The rate of Emergency Caesarean section was 48.6% for antepartum fetal compromise and the mean birth weight was 1414 gms. The PNMR was 302/1000births with a still birth rate of 18% and neonatal mortality of 13%. The live birth rate was 80% percent with a take home baby rate of 86%. This shows the optimum perinatal care and this analysis is useful to counsel the women regarding mode of delivery when AEDF is diagnosed beyond 28 weeks of pregnancy and the neonatal outcome of such foetuses.

INTRODUCTION:

Optimum fetal oxygenation is important for good perinatal and long term neurological outcome of Neonates¹. CTG and Doppler assessment of blood flow are indirect measures of fetal oxygenation. Of the various studies of Doppler, umbilical blood flow studies are the recommended ones in clinical practice for antenatal and intranatal management. The perinatal outcome is different in various studies where abnormal umbilical Doppler wave forms (AEDF) were reported and there are no clear management guidelines regarding the time of delivery and mode of delivery. Adverse perinatal outcomes were predicted earlier when there is absent and or reversed end diastolic flow when compared to CTG findings alone². This retrospective study was undertaken to find out the clinical profile of pregnant women with absent end diastolic flow, gestational age at which AEDF was diagnosed, prolongation of pregnancy, mode of delivery and the perinatal outcome.

MATERIAL AND METHODS:

Pregnant women in whom absent end diastolic flow in the umbilical waveform was diagnosed are included in the study. Maternal details like age, parity, gestational age, Medical disorders or Obstetrical disorders complicating pregnancy are collected and recorded on a proforma. Gestational age at termination and prolongation of pregnancy in days was calculated from first trimester ultrasound. Delivery details were obtained from the case records and neonatal details were obtained from the neonatal records and from NICU register. Outcome variables were live birth, still birth and neonatal morbidity and mortality. Data was expressed in frequencies and percentages.

RESULTS:

The clinical Profile is shown in Table 1. The mean age of the participants was 28.5 years. Majority (43%) were primigravidae and only 34% were booked at our Institute and the rest were referred from other hospitals. All women received antenatal care and were immunised. Past history of pregnancy loss in the form of abortion and intrauterine death was present in 10.5% and 6.5% respectively. History of medical disorders prior to pregnancy was present in 10.5%

Table 1: Clinical profile of women with AEDF at admission

Clinical Characteristics	Number(76)	Percentage
Mean age Age in Years	28.5	-
Gravidity Index		
Primigravida	33	43.4
Gravida 2	22	28.9
Gravida 3	10	13.1
Gravida 4	7	9.2

≥5	8	10.5
Booking status		
At JIPMER	26	34.2
Booked outside and referred And referred to JIPMER	50	65.7
Past Obstetric Outcome		
Abortions	8	10.5
Intrauterine death	5	6.5
Pre-existing Medical disorders	8	10.5
RHD	1	
Chronic Hypertension	2	
SLE	1	
Type II DM	2	
Hypothyroidism	2	

Table 2 shows the possible etiological factors. Forty six percent suffered from Hypertension during pregnancy and 10.5% developed hypertension and Diabetes, Hypothyroidism and hypertension was diagnosed in 7.8 percent. Hypothyroidism, hypertension and Type II DM complicated 6.5 percent. The cause is not known in 19.7 percent.

Table 2; Possible Etiological factors for AEDF

Medical or Obstetrical Disorder	Number N=76	Percentage
Hypertension complicating	35	46
Gestational Hypertension	9	
Pre-eclampsia	26	
Diabetes + Hypertension	8	10.5
Gestational Hypertension and GDM	4	
GHT and Type II DM	2	
Pre-eclampsia and GDM	2	
Diabetes only	-	
Hypothyroidism	2	
Hypothyroidism and Hypertension	6	7.8
Hypothyroidism and Early onset severe Pre-eclampsia	4	
Hypothyroidism and chronic hypertension	2	
Hypothyroidism+GHT+Type II DM	5	6.5
GDM +SLE	1	
RHD, MS and MR	1	
Twins	2	
Triplets	1	
Unexplained IUGR	15	19.7
PPROM	3	

Prolongation of pregnancy with respect to gestational age is shown in Table 3. The maximum prolongation was 46 days and minimum only one day. Women admitted at gestation al age of 30+1 day to 32 weeks constituted maximum (35.5 %)

Table 3: Prolongation of Pregnancy with AEDF

Gestational age at diagnosis		Prolongation of Pregnancy		
Gestational age (Weeks)	Number (Percentage)	Days (mean)	Minimum days	Maximun days
28- 30	7 (9.2)	16	1	46
30 + 1 to 32	27 (35.5%)	4.33	1	12
32+1- 34	16 (21%)	2.53	1	6

34+1 - 36	12 (15.7%)	3	1	10
≥ 36+1	14 (18.4%)	2	1	2

Mode of delivery and perinatal outcome is shown in Table 4. Forty nine percent underwent Emergency LSCS for antepartum fetal compromise. Induction of labour was undertaken in 31.5 % and out of which 50% had emergency LSCS for intrapartum fetal distress. Elective LSCS was undertaken in 9.2% Spontaneous preterm birth resulted in 10.5%. The live birth rate is 80% and 13% suffered neonatal deaths. The mean birth weight was 1414 gms among those who underwent antepartum Emergency Caesarean section and 1467 among those who underwent Elective Caesarean section. The mean birth weight was 1378 gms in those who were subjected to induction of labour. Take home baby rate was 86% out of all live births

Table 4 : Mode of Delivery and Perinatal outcome

Mode Delivery	Number (%)	Mean Birth weight (Grams)	Perinatal Outcome		
			Live birth	Still birth	Neonatal death
Elective LSCS	7 (9.2)	1467 . 14	7	-	-
Emergency LSCS (Antepartum)	37 (48.6)	1414 . 35	37	-	2
Induction of labour	24 (31.5)	1378 .6	14	6	
Emergency LSCS	12		12		2
Vaginal delivery	12		6	6*	2
Induction for IUD	4 ((5.2)	823± 75	-	4	-
Spontaneous Preterm Labour	8 (10.5)	1020	3	5	2
Total	76	-	61 (80.2%)	15 (19.7%)	8 (13%)

*Mean birth weight is 1056 gms
PNMR=302 per 1000 births

The perinatal outcome was shown in table 5. Among the 15 stillbirths, 11 occurred during intrapartum . among the neonatal deaths sepsis was the commonest cause. Congenital fetal malformations were diagnosed in 7 (9.2%) fetuses out of which CHD was present in 3 and Down's syndrome in 3. The perinatal loss or mortality is 302 per 1000 births

Table 5; Perinatal Outcome

Perinatal Outcome	NumberN=76	Percentage
Live births	61	80.2%
Still births	15	19.7%
Macerated	4	
Intrapartum	11	
Neonatal death	8	13%
Neonatal morbidity	13	17%
Neonatal sepsis	5	
RDS	4	
Hypoglycaemia	2	
Necrotising enterocolitis	2	
Congenital Problems	7	9.2%
Congenital Heart disease	3	
Complex (ASD+PDA+VSD)	1	
PDA	1	
ASD	1	
Primary pulmonary hypertension	1	
DOWN's Syndrome	3	
PNMR	302 per 1000 births	

DISCUSSION:

Fetal oxygenation depends on many factors like maternal oxygenation, maternal medical disorders , placentation and placental abnormalities and also on the intrinsic factors of the fetus. When there is absent end diastolic flow the umbilical blood pH was in acidotic range in 46% of the fetuses³. The fetuses which show absent end diastolic or reverse diastolic flow were reported to suffer from cerebral haemorrhage, anaemia and hypoglycaemia long term permanent neurological damage and high neonatal mortality^{4,5}. It is essential to ensure the presence of good fetal oxygenation before , during and at the time of delivery of the fetus. This can be assessed and achieved indirectly by Doppler flow measurements.

The maternal characteristics of foetuses who showed AEDF were young nulliparous women in almost 50% of the time and the

commonest reason for the same was hypertension complicating pregnancy (72%) and IUGR without maternal disease in 19%.⁶ In the present study also young primigravidae constituted 43.4% and more than 65% of women were referred from elsewhere. Hypertension alone was the cause in 46% and in another 25% hypertension was associated with Diabetes hypothyroidism. Hypertension was the commonest cause for AEDF in thevarious studies reported,

Pregnancy could be prolonged for a maximum of 46 days in women with gestational age between 28-30 weeks with a mean of 16 days. The median time from diagnosis to delivery was reported to be 11 days. No studies addressed on prolongation of pregnancy as such but on prolongation progression to REDF resulted in increased composite mortality⁷

Caesarean section rate is high and it was advocated when expected birth weight was more than 1000 gms. A CS rate of 84% was reported by Verghese and colleagues⁷. The commonest indication for Caesarean delivery was fetal distress which is similar to the study of Pauline NAA and colleagues⁶

The live birth rate was 80% and still birth rate was 20% and it is similar to other studies^{6,8}. Of the live births 13% suffered neonatal mortality and the overall perinatal mortality was 302 per 1000 births. The perinatal mortality was reported to be increasing with severity of Doppler findings and it was 5 .5 folds high in foetuses with REDF when compared to AEDF⁹

Studies are sparse on the outcome of foetuses with absent end diastolic flow and many factors like gestational age, expected fetal weight parity, medical disorders complicating and their severity and overall maternal health needs to be taken in to account while managing women with foetuses showing absent end diastolic flow. More studies are warranted in this area for effective counselling regarding mode of delivery amd neonatal prognosis

CONCLUSION:

The clinical profile of women carrying foetuses with AEDF is primigravide with medical disorders, commenst being hypertension complicating Pregnancy. Majority belonged to 30 to 32 weeks gestational age . Caesarean section was needed in more than 50% and the live birth rate was more than 80% with an acceptable neonatal moratlity rate of 13%. The take home baby rate of 86% among live born shows optimum perinatal care

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