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Maternal and fetal outcome in oligohydraminos patients assesment is done by NST and doppler changes and find out which is best among both

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Abstract
The pregnant women attending antenatal clinics or labour room in C.P.R. Hospital, Kolhapur from all units were screened by ultrasonography. The cases with gestational age more than 28 weeks with (AFI) equal to or less than 7 were included in study. The data was collected during 2013-2014. Cases falling into exclusion criteria were later excluded from study. The data were analysed for maternal and neonatal outcome. Oligohydramnios are studied in different combination with Normal NST with Normal Doppler, Abnormal NST with Normal Doppler, Normal NST with Abnormal Doppler, Abnormal NST with Abnormal Doppler. Their results are compared and found that Abnormal NST with Abnormal Doppler has worst maternal and fetal outcome as compared to Normal NST with Normal Doppler. As NST and Doppler varies with multiple factor so we can't predict which is superior among them.

Keywords: AFI, NST, doppler, oligohydraminos

Introduction
Amniotic fluid provides a specialized environment for normal development, growth and wellbeing of fetus. In fact it is essential for normal fetal lung development and to avert umbilical cord compression [1, 2]. Amniotic fluid protects the fetus from trauma, allows musculoskeletal development. It also maintains temperature and has a minimal nutritive function. Amniotic fluid volume is a result of a balance between its absorption and production. Various factors are involved in this dynamic process [3, 4]. Abnormal amount of amniotic fluid such as oligohydramnios (decreased amniotic fluid) and polyhydramnios (increased amniotic fluid) are associated with increased maternal and fetal mortality and morbidity. Because of higher chances of cord compression in oligohydramnios the fetus is jeopardized commonly showing increased incidence of fetal distress meconium staining, birth asphyxia [3]. Today, with availability of ultrasonography, abnormal quantities of amniotic fluid can be detected easily. Hence the risk to mother as well as to fetus can be predicted. Amniotic fluid index is the ultrasound method used to measure amniotic fluid volume [5]. Amniotic fluid index is used to measure the amniotic fluid volume because of its reliability, ease of measurement, normal range is has been defined and procedure is non invasive [6]. Oligohydramnios is defined when amniotic fluid index is less than 5th percentile of the standard [4]. Oligohydramnios is often associated with various maternal and perinatal outcomes. So this study is conducted to understand clinical profile and role of nst and doppler to assess the maternal and perinatal outcomes.

Materials and Methods
The pregnant women attending antenatal clinics or labour room in C.P.R. Hospital, Kolhapur from all units were screened by ultrasonography. The cases with gestational age more than 28 weeks with Amniotic Fluid Index (AFI) equal to or less than 7 were included in study. The data was collected during 2013-2014. Cases falling into exclusion criteria were later excluded from study. All the patients were admitted in antenatal ward for the study. All the women were subjected to detailed history, thorough general, systemic examination and obstetric examination with special reference to symphysiofundal height, abdominal girth and clinical amount of liquor. Per speculum examination was done for any leak or show. On per vaginal examination Bishops score was calculated from cervical dilatation, effacement, consistency and station. Ultrasonography was done for determination of fetal wellbeing, serial determination of AFI,

gestational age and expected fetal weight.
Fetal monitoring was done by using Daily Non Stress Test for any non assuring FHR and Colour Doppler for uteroplacental and fetoplacental blood flow. Mode of induction of labour and Mode of delivery whether normal delivery or Instrumental Delivery in the form of Forceps/ Ventouse or LSCS was noted.
Neonatal assessment was done by Apgar score at one minute and five minutes. NICU admission and neonatal intervention or any other fetal complication in the form of meconium aspiration syndrome was noted.
Mothers and babies were observed in the hospital until discharge from hospital and any postnatal maternal and neonatal complications were noted. The observations were recorded in a Performa. The data were analysed for correlation of operative interventions and overall maternal and neonatal outcome.

Inclusion Criteria
1. Pregnancy with more than 28 weeks of gestation.
2. AFI equal to or less than 7 cm.
3. Intact amniotic membrane.

Exclusion Criteria
1. Patients with premature rupture of membrane.
2. Multiple gestation.
3. Patients with fetal congenital anomaly.
4. Intrauterine death.
5. Ante partum haemorrhage

Results and Discussions

Table 1: Association of FHR deceleration and Obstetric outcome

	FHR deceleration Present (Total-57)	FHR deceleration Absent (Total-243)
Elective LSCS	10 (18%)	18 (7%)
Emergency LSCS	25 (44%)	43 (18%)
Instrumental Delivery	1 (1%)	6 (2%)
Vaginal Delivery	21 (37%)	176 (72%)
LSCS for Fetal Distress	20(35%)	27 (11%)
Meconium Stained liquor	9 (15%)	47 (%)
Apgar score <7	12 (21%)	55 (23%)
NICU Admission	12 (21%)	48 (20%)

Patients with FHR decelerations have more operative intervention in terms of Elective LSCS 10(18%) Emergency LSCS 25(47%). Also the LSCS for fetal distress 20(37%) meconium stained liquor 9(16%) Apgar score <7- 12(22%) NICU admission 12(22%) were more in patients having FHR decelerations.

Table 2: Association of Obstetric Doppler pattern and perinatal outcome

	Normal Doppler (Total-220)	Prediastolic notch in Uterine/ Umbilical Artery (Total-71)	Absent or Reversal of diastolic flow in uterine or umbilical Artery (Total-9)
Elective LSCS	10 (%4%)	14 (20%)	4 (44%)
Emergency LSCS	48 (21%)	20 (28%)	0
Instrumental Delivery	5 (2%)	1 (3%)	1(12%)
Vaginal Delivery	157 (71%)	36 (49%)	4 (44%)
LSCS for Fetal Distress	31 (14%)	16 (23%)	0
Meconium Stained liquor	39 (18%)	17 (24%)	0
Apgar <7	38 (17%)	20 (28%)	9 (100%)
NICU Admission	31(14%)	20 (28%)	6 (67%)
NND	4 (2%)	3 (4)	2 (22%)
Still Birth	0	0	3 (33%)

Patients with abnormal Colour Doppler have more operative intervention in terms of Elective LSCS 18(22%), Emergency LSCS 20(25%). Also the LSCS for fetal distress16 (20%) meconium stained liquor 17(21%) Apgar score <7 -29(36%), NICU admission 26.

Table 3: Maternal outcome associated with NST and Doppler changes.

Maternal Outcome	Normal NST Normal Doppler	Abnormal NST Normal Doppler	Normal NST Abnormal Doppler	Abnormal NST Abnormal Doppler	Total
Elective LSCS	5(3%)	6(12%)	15(21%)	2(22%)	28(9%)
Emergency LSCS	16(9%)	30(63%)	20(28%)	2(22%)	68(23%)
Instrumental	4(2%)	1(2%)	1(1%)	1(12%)	7(2%)
Vaginal delivery	147(85%)	11(25%)	35(50%)	4(44%)	197(65%)
Total	172	48	71	9	300

Chi square Df=1	P
103.66	<0.00001 HS

2out 9 patient of abnormal NST and abnormal Doppler required LSCS and 1 instrumental delivery. Abnormal NST and Abnormal Doppler group suggest worst maternal outcome as compare to other group. There is statistically significant difference between these groups.

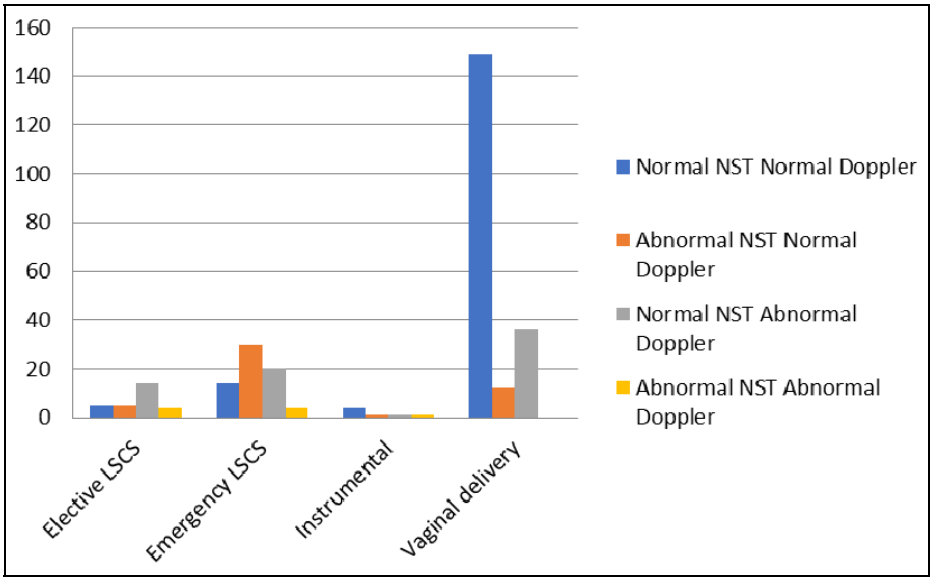

Fig 1: Maternal outcome associated with NST and Doppler changes

Table 4: Fetal outcome (Apgar) associated with NST and Doppler changes.

Fetal Outcome	Normal NST Normal Doppler	Abnormal NST Normal Doppler	Normal NST Abnormal Doppler	Abnormal NST Abnormal Doppler	Total
Apgar <7	6(9%)	12(18%)	13(19%)	36(54%)	67(22%)
Apgar >7	140(60%)	40(17%)	44(19%)	9(4%)	233(78%)
Total	146	52	57	45	300

Chi square Df=1	P
114.25	<0.00001 HS

54% babies have Apgar <7 and 9% have Apgar > 7 which is from abnormal NST and abnormal Doppler group. 6% babies have Apgar <7 and 60% have Apgar > 7 which is from normal NST and normal Doppler. Difference between these two groups is statically significant.

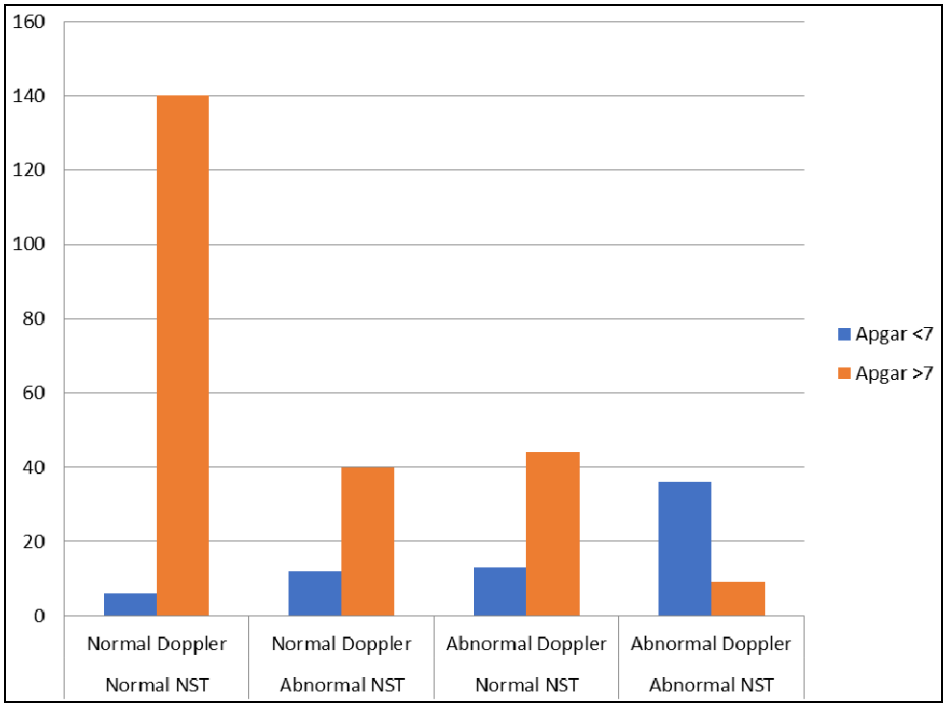

Fig 2: Fetal outcome (Apgar) associated with NST and Doppler changes

Table 5: Fetal outcome (NICU) associated with NST and Doppler changes.

Fetal Outcome	Normal NST Normal Doppler	Abnormal NST Normal Doppler	Normal NST Abnormal Doppler	Abnormal NST Abnormal Doppler	Total
NICU Admission	4(6%)	13(22%)	13(22%)	30(50%)	60(20%)
NoNICU Admission	160(67%)	39(16%)	39(16%)	2(1%)	240(80%)
Total	164	52	52	32	300

Chi square Df=1	P
142.016	<0.00001 HS

50% babies have NICU admission from abnormal NST and abnormal Doppler group. 6% NICU admission is from normal NST and normal Doppler. Difference between these groups are statically significant.

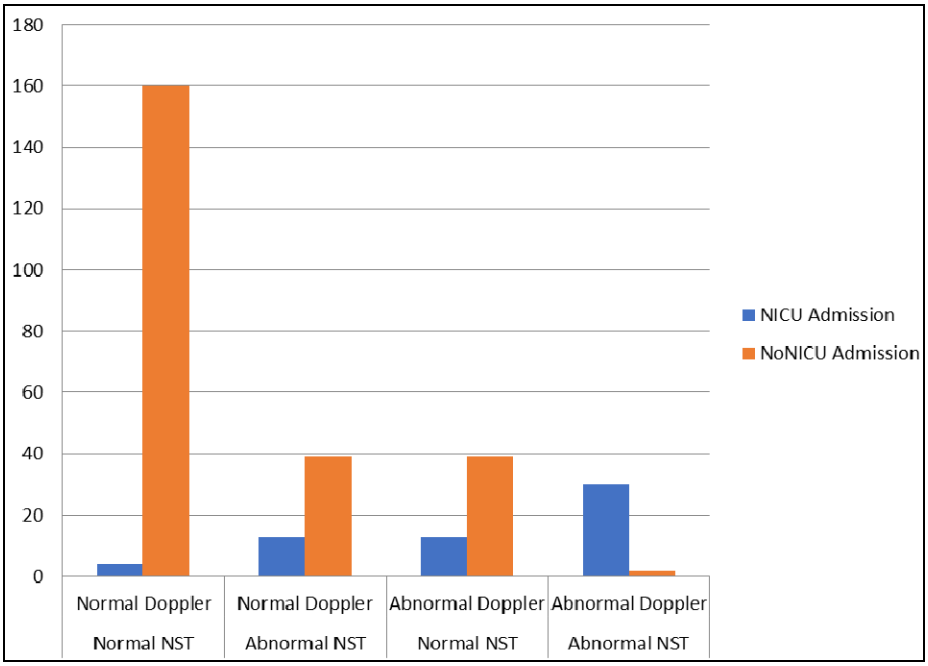

Fig 3: Fetal outcome (NICU) associated with NST and Doppler changes

Table 6: Fetal outcome (Preterm, NND, Still birth) associated with NST and Doppler changes.

Fetal Outcome	Normal NST Normal Doppler	Abnormal NST Normal Doppler	Normal NST Abnormal Doppler	Abnormal NST Abnormal Doppler	Total
Preterm birth	0	41	42	4	87
Term birth	172	3	26	0	201
NND	0	4	2	3	9
Still birth	0	0	1	2	3
Total	172	48	71	9	300

Chi square Df=1	P
320.67	<0.00001

Abnormal NST and abnormal Doppler has worst fetal outcome as compare to other group which is stastically significant.

Discussion

Three hundred patients with gestational age 28 weeks or more with AFI less than 7cm were studied prospectively from May 2013 to June 2014. All the patients were admitted in antenatal ward for the study. After admitting the cases, All the patient were subjected to NST and colour Doppler. The aim was to compare those methods to decide the plan of action after studying the results of those two tests. Both procedure are complimentary to each other and have different methodology and interpretation. However in oligohydramnios the fetus is always at risk and needs to evaluate frequently as the term reached. Associated IUGR and intrauterine hypoxia needs to be diagnosed.

The percentage of abnormal FHR tracing i.e. decelerations in patients with oligohydramnios was 48% in the study of Sarno *et al*; 57% in the study of Robson *et al*; 71% with Phelan *et al*; and 44% in the Rutherford's study as shown in meta-analysis by Chauhan. (1996) [7] Our study showed fetal heart rate deceleration in 60 (20%) patients with oligohydraminos (Table 1). Voxman *et al*. (2002) [8] observed that women with oligohydramnios were significantly more likely to have abnormal fetal heart rate tracings (14.9% vs 5.3%; p 0.005) and there was an increased rate of caesarean section for fetal distress (9.7% vs 5%; p = 0.06).

Patients with FHR decelerations have more operative intervention in terms of Elective LSCS 10(18%) Emergency

LSCS 25(47%). Also the LSCS for fetal distress 20(37%) meconium stained liquor 9(16%) Apgar score <7- 12(22%) NICU admission 12(22%) were more in patients having FHR decelerations (Table 1). Similar conclusion was observed by Grubb *et al*. (1992) in their study. [9, 10]

In our obstetric Colour Doppler finding was abnormal in 80(26.66%) patients. (Table 2). Patients with abnormal Colour Doppler have more operative intervention in terms of Elective LSCS 18(22%) Emergency LSCS 20(25%). Also the LSCS for fetal distress 16(20%) meconium stained liquor 17(21%) Apgar score <7 29(36%) NICU admission 29(36%) were more in patients having abnormal Colour Doppler (Table 2). Lombardi *et al*. in their study found of the 22 patients with oligohydramnios, 13(59%) had normal umbilical artery Doppler velocimetric waveforms (group 1) and 9(41%) abnormal waveforms (group 2). All patients in group 2 were delivered either by induction of labour or by caesarean section had abnormal perinatal outcomes. Seven out of nine had fetal distress. [11]

Method of delivery also depend on the findings of NST and Doppler studies.

The caesarean section rate was high in cases showing poor NST and abnormal doppler55%. The vaginal delivery rate was 87% in cases with reactive NST and normal Doppler studies (table 3)

54% babies have Apgar <7 and 9% have Apgar > 7 which is from abnormal NST and abnormal Doppler group. 6% babies have Apgar <7 and 60% have Apgar > 7 which is from normal NST and normal Doppler (table 4).

50% babies have NICU admission from abnormal NST and abnormal Doppler group.6% NICU admission is from normal NST and normal Doppler (table 5).

The NST can be reactive and assuring even though Doppler shows abnormalities which was seen in71 cases. There 2 neonatal death and 1 still birth. In other 48 cases NST was nonreactive but Doppler normal. There was 4 neonatal death in this group but in 41 cases the labour was induced. The prognosis was slightly better ((14.5% against4%). In abnormal NST and abnormal Doppler, there were 2 still birth and 3 neonatal death (table 6).

These findings suggest that both methods are important and show poor prognosis if they show abnormal findings.

Our study shows that abnormal NST carries a poor prognosis than abnormal Doppler findings. Similarly abnormalities in both having poor neonatal outcome.

Oligohydramnios are studied in different combination with Normal NST with Normal Doppler, Abnormal NST with Normal Doppler, Normal NST with Abnormal Doppler, Abnormal NST with Abnormal Doppler. Their results are compared and found that Abnormal NST with Abnormal Doppler has worst maternal and fetal outcome as compared to Normal NST with Normal Doppler. As NST and Doppler varies with multiple factor so we can't predict which is superior among them. But both NST and Doppler are potential method of identification of fetus at high risk.

Conclusion

Non stress test, Obstetric Colour Doppler, Biophysical Profile and Vibroacoustic Stimulation test are the methods used for fetal surveillance in oligohydramnios patients. Oligohydramnios are studied in different combination with Normal NST with Normal Doppler, Abnormal NST with Normal Doppler, Normal NST with Abnormal Doppler, Abnormal NST with Abnormal Doppler. Their results are compared and found that Abnormal NST with Abnormal Doppler has worst maternal and fetal outcome as compared to Normal NST with Normal Doppler. As NST and Doppler varies with multiple factor so we can't predict which is superior among them. But both NST and Doppler are potential method of identification of fetus at high risk.

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