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Profile of high risk and low risk pregnant women attending tertiary care hospital

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Abstract
Fetal well-being depends on adequate functioning of sources and balance between supply of oxygen and waste removal mechanisms. These include maternal system, the placenta, the uterus and the umbilical cord. At this time relationship between specific fetal heart rate patterns and fetal academia is supported by observational studies and the relationship appears to be strong. The high risk groups and low risk group population were selected by history, clinical examination and relevant investigation. The study population consists of 229 women. Out of which 130 high risk patients and 99 low risk patients of Booked & un-booked cases from OBG OPD, wards, prelabour & labor room. In our study, out of 229 cases 130 were high risk pregnancy and 99 cases were low risk pregnancy. Out of 130 high risk pregnancies there were 82 non-reactive NST and 48 non-reactive CTG.

Keywords: High risk pregnancy, NST, CTG

Introduction
The rationale for electronic fetal monitoring (EFM) is based on the knowledge that when normal metabolic processes are interrupted, either by lack of oxygen (O_2) or an inability to expel end products, the subsequent accumulation of acids may damage all or part of the living system.
Fetal well-being depends on adequate functioning of sources and balance between supply of oxygen and waste removal mechanisms. These include maternal system, the placenta, the uterus and the umbilical cord. At this time relationship between specific fetal heart rate patterns and fetal academia is supported by observational studies and the relationship appears to be strong [1].
Because the fetal heart rate pattern appears to assume certain characteristics under the influence of various hypoxic and non-hypoxic stresses, it becomes important for the clinician to have a basic understanding of the physiology of fetal respiratory exchange and the physiologic control of the FHR [2].
The maternal respiratory system is the primary source of oxygen for the fetus. If the maternal oxygen carrying capacity is diminished, fetal oxygenation is certain to be decreased. This can occur in conjunction with maternal respiratory, circulatory, hemolytic or cardiac condition that affects maternal oxygenation. To maintain optimal or even sufficient fetal oxygenation, maternal oxygenation must be adequately maintained and supported [3]
The placenta is the organ that connects the maternal and fetal systems and performs many of the same functions for the fetus that its lungs will later assume in extra uterine life. The fetus thus relies on the placenta for transfer of oxygen and nutrients and removal of waste products. The placenta accomplishes this through the villi, fetal tissue that projects into maternal blood circulating in the inter villous space. It is through these projections that the transfer of oxygen, carbon dioxide, and nutrients occur. Oxygenated blood from the mother is carried to the placenta by uterine arteries. Blood enters the inervillous space under positive arterial pressure, bathes the fetal villi and then drains back to the maternal vein [4].
A microscopic layer of fetal trophoblasts in the placenta serves as filter, permitting the exchange of nutrients and waste products between the maternal and fetal systems without fetal and maternal blood cells coming into contact with one another. The passage of nutrients or waste products across this membrane occurs due to six mechanisms: facilitated diffusion, passive diffusion, active transport, bulk flow, pinocytosis, and breaks in the system. Deoxygenated blood is carried from the fetus to the placenta through the two umbilical arteries. These umbilical arteries split off into smaller capillaries that traverse the fetal villi. The villi project into the intervillous space, where maternal and fetal blood supplies exchange necessary gases and nutrients.

After this transaction oxygenated blood is carried back into fetal circulation by way of single umbilical vein [5, 6].

Due to vasoconstriction, blood flow across the inervillous space is diminished during uterine contractions. This temporary reduction in perfusion forces the fetus to rely on any oxygen that might be available in its system until the contraction ends and normal blood flow resumes. The vast majority of fetuses show no change in their heart rate or acid-base status during contraction. When placental vasculature and circulation are compromised, however the fetus is likely to be affected by these episodes of diminished placental blood flow.

The blood flow to and through the uterus is a key determinant in placental function. Approximately 10%-15% of maternal cardiac output (500- 750 ml/min) flows through the uterus of term gestation. Unlike the rest of the human vascular system, which can constrict and dilate under central nervous system (CNS) control, the uterine vascular bed is believed to constantly maintain maximum dilation. Only an increase in the maternal cardiac output can improve uterine blood flow [7, 8]

Because uterine blood flow is routinely decreased during contractions, a diminished amount of oxygen, carbon dioxide, and nutrients is exchanged between the fetal and maternal blood during this time. This causes a loss of oxygen to the fetus and a buildup of carbon dioxide within the fetal circulation. Although a healthy, well oxygenated fetus has a small reserve of oxygen from which to draw from, this will be depleted quickly with repeated episodes of hypoxia. With each uterine contraction and subsequent decrease in perfusion, the fetus that is without reserve is placed in life threatening circumstances.

Methodology

Women with high risk pregnancy, non-reactive NST/CTG and women with low risk pregnancy, non-reactive NST/CTG enrolled into the study from 34 weeks of gestation admitted in labor room at Tertiary care Hospital.

The high risk groups and low risk group population were selected by history, clinical examination and relevant investigation. The study population consists of 229 women. Out of which 130 high risk patients and 99 low risk patients of Booked & un-booked cases from OBG OPD, wards, prelabour & labor room.

The inclusion criteria

- Patients of all age group who gave consent.
- Singleton non-anomalous pregnancies of 34 weeks or more week's gestation.
- Only the NST or CTG performed within 7 days prior to delivery and at the admission for labor respectively were considered for fetal outcome.
- Patients with clinically suspected IUGR, pre-eclampsia, gestational diabetes mellitus, PIH (gestational hypertension), chronic hypertension, previous fetal demise, decreased or absent fetal movement,3rd trimester bleeding, prolonged pregnancy, cardiovascular disease, rhesus iso-immunization, previous caesarean section, altered liver function test, adolescent pregnancy and oligohydramnios.
- Preterm labor more than 34 weeks.

Results

Table 1: Distribution of age groups according to high (n=130) and low risk (n=99)

Age	High Risk	%	Low Risk	%	p value
19-21	17	13.08%	19	19.19%	0.0023 Significant
22-24	22	16.92%	19	19.19%	
25-27	34	26.15%	31	31.31%	
28-30	35	26.92%	30	30.30%	
>30	22	16.92%	0	0.00%	
	130		99		

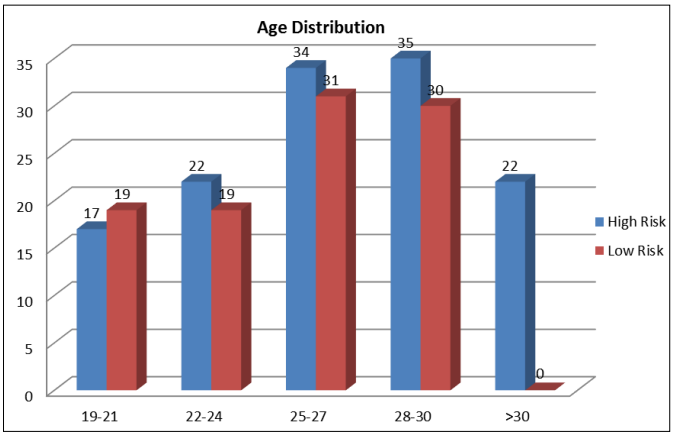

Fig 1: Age distribution of high risk (n=130) and low risk (n=99) pregnancy cases

In the above table, it is evident that maximum number of patients belonged to 25-30 (53%) in high risk and 25-27 (31.31%) in low risk.

Table 2: Comparison of Mean Age of High Risk and Low Risk Pregnancy

	High Risk	Low Risk
Mean	26.85	25.20
SD	4.37	3.08
Minimum	19	20
Maximum	40	30

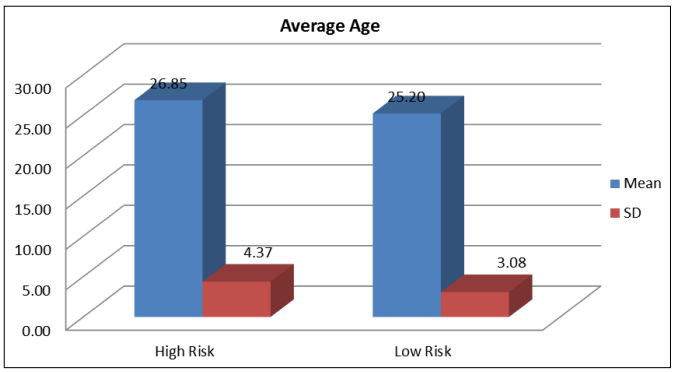

Fig 2: Mean Age Distribution High and Low Risk Pregnancy

The mean age of high and low risk pregnancy do not differ significantly since the samples are from the same population.

Table 3: Distribution of Patients Based on Non-reactive NST and CTG between High and Low Risk Pregnancy

	High Risk	Low Risk	Total	p Value
NST result	82	29	111	0.0001
CTG results	48	70	118	0.0041
Total	130	99	229	

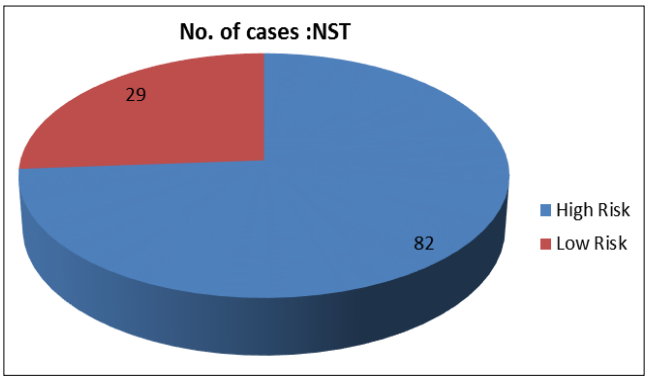

Fig 3: Distribution of Patients based on Non-reactive NST in High and Low Risk

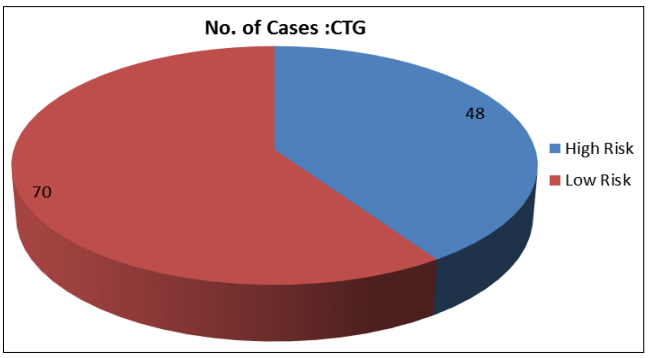

Fig 4: Distribution of Patients Based on Non-reactive CTG in High and Low Risk

The patients in high and low risks groups were classified based on non-reactive NST/CTG categories. Accordingly, there were more number of patients in NST group among the high risk and similarly more number of patients in CTG group in low risk: found to be statistically significant.

Discussion

229 pregnant women were enrolled into a study conducted at Tertiary care Hospital to evaluate the role of nonreactive NST or non-reactive CTG as a means of antepartum surveillance and in predicting perinatal outcome. A thorough history was taken, general & local examination and relevant investigation done. The procedure was explained to the patients and informed consent was taken.

All the pregnancies were followed up by NSTs from 34 weeks onwards till delivery either done weekly or biweekly for a period of 20 minutes and for nonreactive results, VAST was done and the test was extended up to 55 minutes. The NST done within 7 days of delivery was used for correlation with the perinatal outcome. CTG was done when patient came in labor.

In our study, out of 229 cases 130 were high risk pregnancy and 99 cases were low risk pregnancy. Out of 130 high risk pregnancies there were 82 non-reactive NST and 48 non-reactive CTG. The mode of delivery, perinatal morbidity were studied in all the women.

The incidence of vaginal delivery is 13.07%, incidence of instrumental delivery is 8.4% and incidence of operative delivery is 78.46%.

Public health is the science and art of preventing disease, prolonging life and promoting health through organized efforts of society. Surveillance of the fetus during labor is preventive care; the aim of fetal surveillance and other forms of labor management is to ensure the delivery of a healthy baby in good condition with minimum intervention.

There are various antenatal surveillance modalities for use in high pregnancies, such as NST, CTG, Biophysical profile etc. Among the modalities available, NST is one of the easiest to perform and is cost effective. There is considerable amount of clinical literature that supports the use of NST in the management of high risk pregnancies. According to Devoe LD, a good screening tool should be able to discriminate between normal fetuses (sensitivity). It should make few mistakes in identifying healthy fetuses (negative predictive value) and sick fetuses (positive predictive value) [9].

British guidelines [10]. Published in do not recommend the labor admission test in low risk women, while Swedish guidelines published the same year [11]. Recommend the test in all women. The British recommendations were based upon three studies and the Swedish upon seven studies [12].

Conclusion

In our study, out of 229 cases 130 were high risk pregnancy and 99 cases were low risk pregnancy. Out of 130 high risk pregnancy there were 82 non-reactive NST and 48 non-reactive CTG.

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