VALIDITY OF ADMISSION TEST AS A SCREENING TEST IN DIFFERENTIATING HIGH & LOW OBSERVATIONAL ANTENATAL WOMEN

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BRANCH II

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CHENNAI

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CERTIFICATE

This is to certify that the dissertation titled "**VALIDITY OF ADMISSION TEST AS A SCREENING TEST IN DIFFERENTIATING HIGH AND LOW OBSERVATIONAL ANTENATAL WOMEN**" is the bonafide work done by **Dr. K.DHANALAKSHMI** between April 2007 to April 2008 during her M.D.,O.G., course at ISO -KGH, MMC Chennai.

 DEAN   DIRECTOR

MADRAS MEDICAL COLLEGE   ISO-GOVT. KGH

ACKNOWLEDGEMENT

ETHICAL COMMITTEE CERTIFICATE

No:

Dated:

I, **Dr. K. DHANALAKSHMI** apply for the ethical committee certificate for the project **"VALIDITY OF ADMISSION TEST AS A SCREENING TEST FOR DIFFERENTIATING HIGH AND LOW OBSERVATIONAL ANTENANTAL WOMEN"** under the guidance of **Dr. Prof. VASANTHA N. SUBBAIAH, Director, Institute of Social Obstetrics and Gynaecology in Govt K.G. Hospital, Chennai-600 005**

I understand the implications of doing research with human subjects and will fully comply with the regulations and keep the dignity and protect the health of subjects at all costs.

Signature of the Postgraduate Student

I have no objective to guiding this postgraduate student in the project mentioned above. I shall supervise to the extent that all the human rights are protected and research is carried on with utmost humanitarian principles

Signature of the Guide

Director of Social Obstetrics
Institute of Social Obstetrics and
Govt Kasturba Gandhi Hospital
For Women and Children.
Triplicane, Chennai-600 005
Seal of Guide

I certify that this project has been presented in front of the Ethical Committee on duly formatted in this institution and that all the members of the ethical committee have given permission to conduct this research

CHAIRMAN ETHICAL COMMITTEE

Date:

Professor & Head
Dept. of Community Medicin
Stanley Medical College
Chennai – 600 001.
Seal

CONTENTS

Introduction

INTRODUCTION

Non Stress test is a non invasive test most commonly used for the ante partum evaluation of fetal well being. The rationale underlying this test is that the presence of spontaneous fetal heart rate accelerations with fetal movements is an indicator of fetal well being.

Admission cardiotocogram is usually a 20 min recording of fetal heart rate immediately after admission to labor ward. Abnormal tracing might indicate and identity potential fetal compromise at an early stage and allow early intervention.

Admission test enable the obstetrician to concentrate more on those fetuses having abnormal tracings than those with reactive tracings.

Need for Admission test:

In low resource setting, there is a need to segregate those antenatal women who require constant monitoring, and those who can be monitored as usual. One of the low cost, easily available methods with long term benefit is admission test. Though the initial cost could be high, the recurring cost effectiveness of this test makes it an ideal tool to improve perinatal outcome.

Review Of Literature

Review of literature

Kelly J, Mansfield H, Needlamp in 1982 did a randomized controlled study of ante partum cardiotocography in 300 antenatal women. They found that non-reactive tracings showed a significant association with still births, low apgar scores and poor fetal outcome ($P < 0.04$). Reactive tracings were associated with good perinatal outcome. They concluded that patients with reactive tracings can be managed as out patients.

Manterola Alvarez D, Angeles Weintraub CD studied the usefulness of cardiotocography in the decision of pregnancy interruption in 100 patients. The patients were divided into three groups in relation to the non stress test made before delivery (Reactive, Non reactive, Non Reactive with decelerations). They concluded that cardiotocography is a useful procedure for the surveillance of these fetuses, and established a good correlation between progressively ominous traces and fetal condition at birth .

Kidd LC, Patel NB, Smith R in 1985 did a randomized controlled trial to examine the effects of non-stress ante partum cardiotocography on obstetric management and to asses its usefulness as a diagnostic test of fetal compromise in 396 antenatal women. They found that the frequency of intra partum fetal distress and low apgar scores were similar in both

groups. They concluded that availability of non-stress cardiotocography was not associated with increased rate of induction of labor or caesarean section.

Brown VA, Sawers RS, patients RJ did a prospective randomized controlled trial to know the value of routine antenatal cardiotocography in the management of high risk pregnancy in 353 antenatal women in 1982. All patients had a weekly CTG trace during the last 6 weeks of pregnancy and according to the random allocation the tracings were concealed from or available to the clinicians. Other methods of assessing fetal welfare were available to both groups. In low risk pregnancy, there was no significant difference between concealed & revealed groups in mode of delivery, Birth, Weight, Apgar score and neonatal morbidity. But in high-risk group, a significant difference occurred in mode of delivery, Apgar and fetal outcome between concealed and revealed group. They concluded that routine use of Antental CTG was useful in high risk than in low risk pregnancies.

Lenstrup C. Haese N (1990) studied 500 antenatal women to evaluate the predictive value of ante partum NST for fetal well being. The predictive values to identity perinatal mortality rate with reactive and non reactive NST were 87.4% and 55.1% respectively. They concluded that NST appears to be a reliable test of ante partum assessment of fetal well being.

Emmen L, Visser GH in 1975 did a study on antepartum diagnosis of the terminal fetal state by cardiotocography. They found that half of the fetuses with reduced beat-to-beat variation and late decelerations had severe metabolic acidosis at birth.

Flynn Am, Kelly J did a study on evaluation of fetal well being by antepartum cardiotography in 301 patients in 1977. Tracings from each patient were classified as reactive or non-reactive. Perinatal mortality, fetal distress in labor, incidence of caesarean section and incidence of low apgar scores were increased in Non reactive group.

Solum J, Ingemarsson I did a study (1979) on evaluation of selection criteria for antenatal cardiotocography. They conducted their study in 812 patients 145 of these patients showed pathological CTG changes. They found that nearly all abnormal CTG's occurred in the high risk group (Those with PIH, IUGR etc). This study showed that high risk pregnancies should be monitored regularly at short intervals to allow early diagnosis of fetal distress. The value of routine CTG in low risk pregnancy is questionable.

Keane NW, Horger Eo, Vice L (1991) studied the effectiveness of NST with perinatal outcome in 566 antenatal women. Perinatal outcome was good with reactive NST than with non reactive group. This study support the concept that precisely defined NST is an adequate screening tool for evaluation of high risk and low risk pregnancies.

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Rayburn W, Greene J 1994 studied the clinical value of admission test and perinatal outcome. They did their study on 561 patients who had undergone NST within one week prior to delivery. Perinatal jeopardy was significantly lower ($P < 0.001$) among pregnancy with recent reactive NST whereas in non reactive NST perinatal jeopardy was 36%

Milliez J, Legrand H, Rochard F (1996) presented a paper which deals with the study of relationships between fetal movements, fetal heart rate accelerations associated with movements, fetal heart rate instability and neonatal outcome. They found a correlation between lack of fetal heart rate accelerations the flatness of the record and poor neonatal outcome.

Vinitha Das, Nidhi Katiyar, G.K. Malik did a prospective randomized study in high and low risk pregnant patients to prove the efficacy of admission test in predicting fetal jeopardy during labor in 175 antenatal patients. The found that the incidence of fetal distress and chances of caesarean delivery were higher in abnormal admission test group (47.8% vs 24%) as compared to reactive admission test group irrespective **of** high or low risk factor.

Neonatal admissions were higher in abnormal admission test ($p < 0.008$) and neonatal mortality was also higher with abnormal admission test ($RR > 2.8$) as compared to reactive admission test group

irrespective of high (or) low risk factors. They concluded that admission test can be used as a primary mean of antepartum fetal surveillance.

Adul K Sood and **Coworkers** did a study (2002) for the evaluation of Non stress test in high risk pregnancy in 204 antenatal patients. Non reactive patterns correlated with significant poorer perinatal outcome in terms of incidence of fetal distress in labor (24%) low apgar scores (32%) neonatal admissions (20%) perinatal mortality (12%). This study concluded that NST can be used as a diagnostic approach for fetal surveillance in high risk pregnancies.

Kushtagi P, Narogoni S did a study on 500 antenatal women (2002) to evaluate the effectiveness of labor admission test as a screening tool. They found that labor admission test was found to have high specificity (93%) and negative predictive value (91%). However the sensitivity (53%) and Positive predictive value (61%) were lower. They concluded that admission test had some predictive value of fetal well being at least 1-2 days after admission.

Mirghani Hm, Khair H did a comparison study between visual and computerized cardiotocography in low risk pregnancy (2005) in 153 antenatal patients. They found that computerized CTG has little advantage over conventional CTG in the prediction of apgar score and need for neonatal intensive care unit admission in a low risk population.

Pattison N, Mccowan L conducted a study in 2003 to asses the effects of antenatal CTG on perinatal morbidity and mortality, maternal morbidity. They found no significant effect of antenatal CTG on perinatal morbidity and mortality. There was an increase in the incidence of interventions such as induction of labor or caesarean section. They found a significant reduction in hospital admission and in patients stay in the reactive cardiotocography group.

Impey L, Reynolds M, Gates S conducted a randomized controlled trial on admission cardiotocography to compare the effect on neonatal outcome of admission cardiotocography versus intermittent auscultation of fetal heart rate. They found that the admission CTG group had good neonatal outcome than intermittent auscultatation group (P=0.002). They concluded that routine use of admission cardiotocography had a role in improving neonatal outcome.

Fawole AO, Sotiloye OS, Sadoh EA (2007) did a comparative study of the perinatal characteristics between infants of mother with reactive and non reactive NST results. They found that non reactive tracings were significantly associated with higher perinatal mortality (p=0.04). Although reactive test was associated with 3 fold reduction in the incidence of low apgar scores when compared with non reactive test, this was not statistically significant (p=0.18). They concluded that when appropriately used, NST has a valuable role for early detection of fetal compromise. It has a place in low resource settings for improving perinatal care.

Aim of the Study

AIM OF THE STUDY

To asses the validity of admission test as a screening test in differentiating high and low observational antenatal women.

Materials And Methods

MATERIALS AND METHODS

Material   :   Fetal Monitor BT – 300

Consists of

1. BT 300 Main body

2. Ultrasound transducer (Doppler Probe)

3. The Co transducer (uterine contraction probe)

4. Event marker

5. Thermal print paper

6. Power adapter

7. Ultrasound gel

8. Transducer Belt

Type of Study

It is a prospective study of assessing the validity of admission test as a screening test to differentiate high and low observational antenatal women.

Place of Study

The study was conducted at Institute of Social obstetrics and Govt. Kasturba Gandhi Hospital, Triplicane, Chennai during period of April 2007 to April 2008

Study Population

800 antenatal women were selected based on inclusion and exclusion criteria.

Inclusion Criteria

1. Primi & Second gravida

2. Singleton pregnancy

3. Cephalic presentation

4. No contra indications for vaginal delivery

5. No Medical, Surgical, Obstetrical complications

Exclusion Criteria

1. Multigravida

2. Preeclampsia

3. Gestational Diabetes Mellitus

4. Multiple pregnancy

5. Abruptio Placenta

6. Heart Disease complicating pregnancy

7. Malpositions and Malpresentations

8. Anemia

9. FGR - Fetal growth restriction

10. Post Term

Non Stress Test

The pregnant mother was asked to empty her bladder and all the procedure, what to expect during the procedure and what is expected of her were explained to her. She is placed in the semi fowler's position. The ultrasound transducer is applied to the maternal abdomen with a gel interface and the fetal heart rate is observed for 20 min. The patient to asked to press the event marker every time she perceives fetal movement. Presence of spontaneous fetal heart rate accelerations with fetal movement is an indicator of fetal well being.
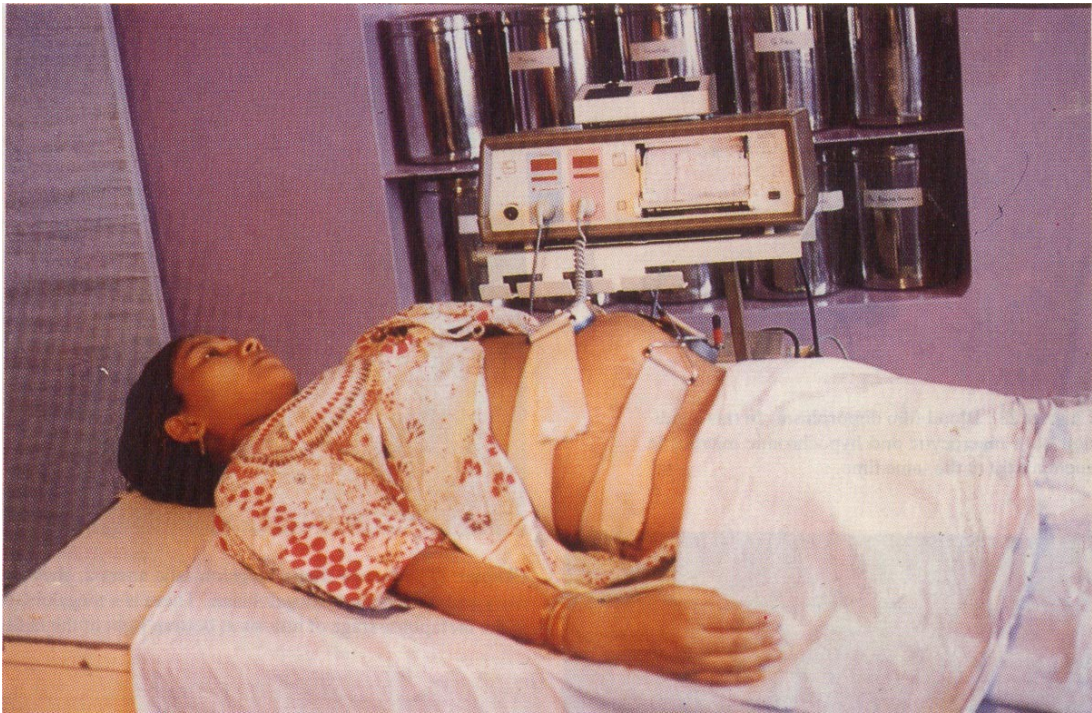
Electronic Mointoring Of Fetal Heart Rate And Uterine Contraction

METHOD OF STUDY

Antenatal Women who are admitted through casualty were taken for the study based on the inclusion and exclusion criteria. After eliciting the history and complete clinical examination of the patient (both general & obstetrical) consent was obtained from each patient for admission test. Before getting consent from the patients, the entire procedure is explained to her.

The admission test is performed on each patient for 20 minutes. The admission test tracings were typed into (i) Reactive (ii) Suspicious (iii) ominous. Depending on the type of tracings, the mode of management varies.

Patient can be divided into low and high observational status depending upon the tracings.

Low observational status – Reactive tracing

High observational status - Suspicious + Ominous Tracings

If the admission test tracings are reactive and not in immediate labor, she is transferred to antenatal ward. If the tracings are ominous, she is transferred to labor ward and further management decide base on individual condition.

In suspicious tracings, the patient is transferred to I stage labor room. After giving intravenous hydration and nasal oxygen, the admission test is repeated after 30 minutes. If the repeat admission test is reactive, she is observed in the low observational unit.

When the repeat admission test is still suspicious, she is shifted to high observational unit and additional measures to monitor fetus are initiated. Necessary interventions are effected depending on individual outcome.

NST Variables to be evaluated are
- Baseline fetal heart rate
- Variability of fetal heart rate
- Presence or absence of accelerations
- Presence or absence of decelerations

Normal, Reassuring or reactive

- Two or more accelerations (>15 beats / min) lasting for more than 15 sec) in 20 minutes

- Base line fetal heart rate 110-150 beats / min

- Baseline variability 5-25 beats / min

- Absence of decelerations

- Moderate tachycardia / bradycardia and accelerations
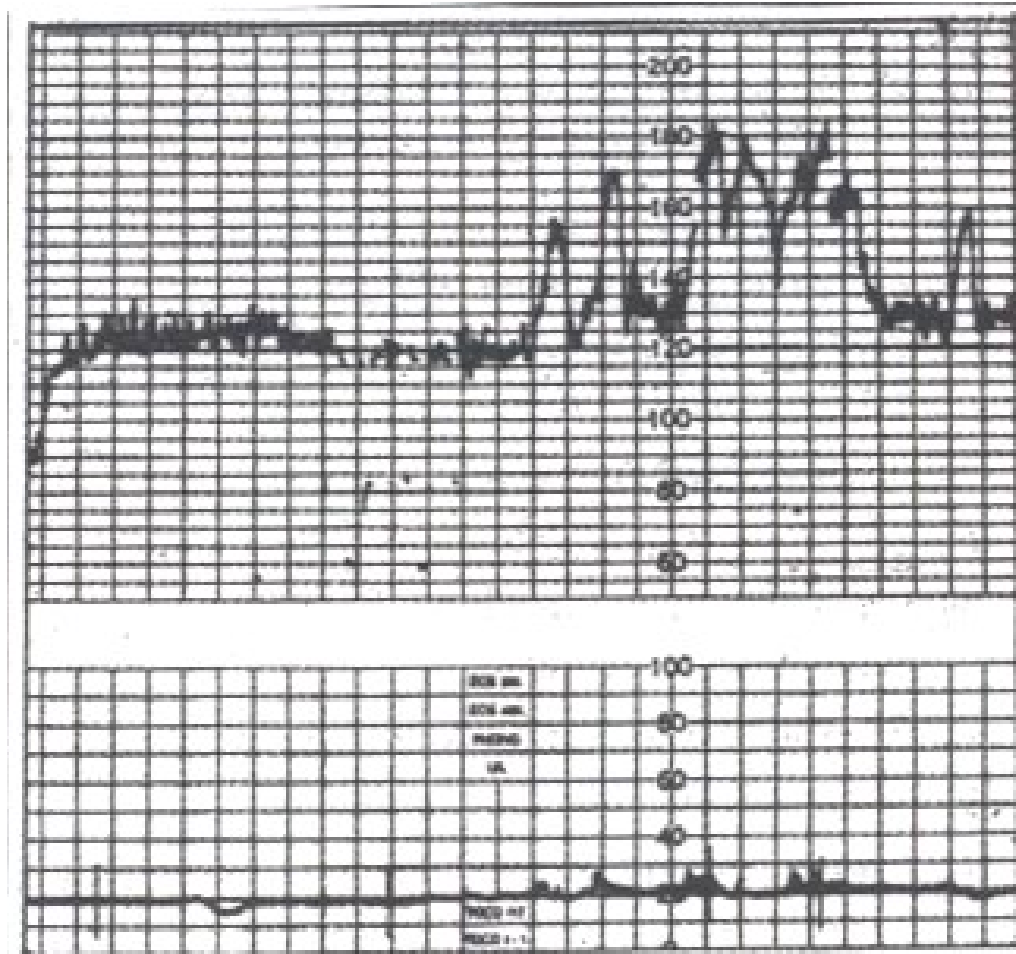
Fig. Reactive trace with acceleration

Suspious, Equivocal or Non Reactive

➢ Absence of accelerations

➢ Reduced base line variability (5-10 beats / min) for more than 40 min

➢ Baseline bradycardia (FHR Less than 100 beats / min or tachycardia (FHR more than 150 beats / min).

➢ Presence of decelerations

➢ Variable decelerations depth < 60 beats per min, duration < 60 sec

Vimala - 18 yrs; IP No.2310

Suspicious : i) Base line heart rate > 150 bpm; ii) No accelerations
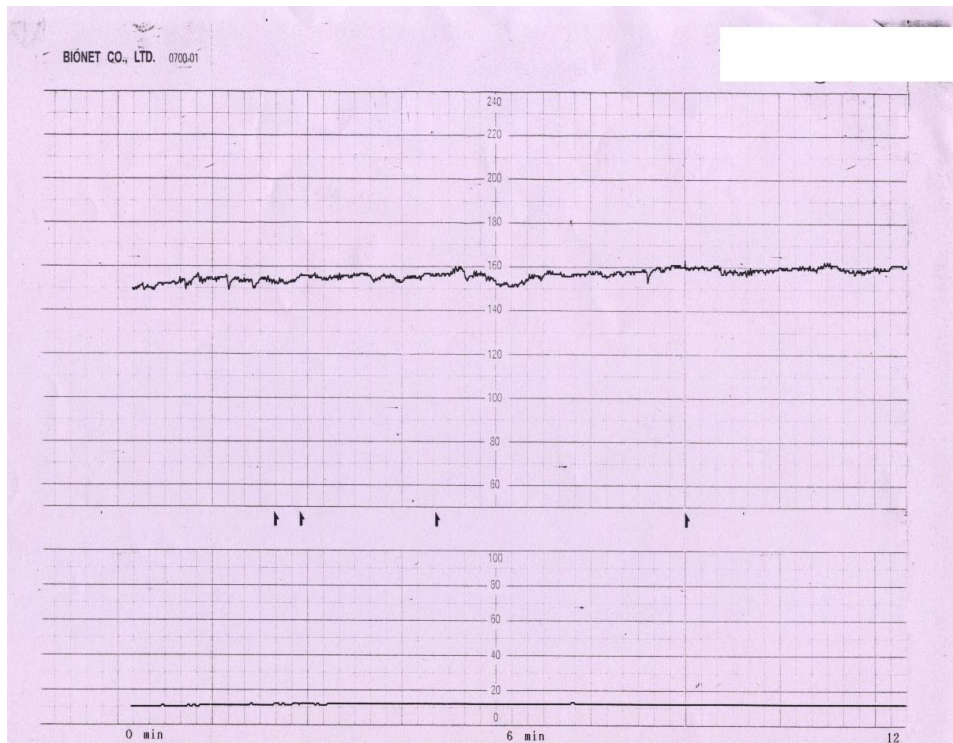
Punitha - 28 yrs; IP No.2290

Suspicious : i) Base line FHR > 150 bpm; ii) No accelerations

Pathologic / Ominous

- Silent pattern (5 beats / min) and baseline fetal heart rate > 150 beats per min (or) < 110 beats / min

- No acceleration

- Repeated late decelerations and or complicated variable decelerations

- Prolonged bradycardia (FHR < 100 beats / min for more than 10 min)
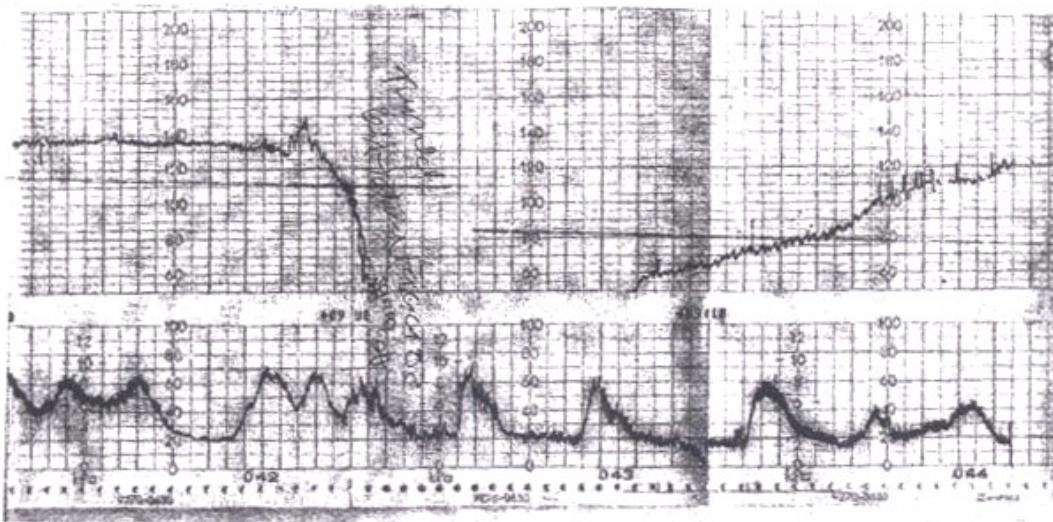
Madhu - 28 yrs; IP No.2309

Omnious: i) Prolonged brodycardia; ii) No accelerations

Other Terminologies

OTHER TERMINOLOGIES

Baseline fetal heart rate:

Approximate mean level of the FHR rounded to increment of 5 beats / min during 10 minute tracing segment expressed in beats / min.

Normal range of baseline FHR in term fetus 110 – 150 bpm

Baseline Bradycardia:

➢ Baseline FHR less than 110 beats per min

➢ Suspicious Pattern : Baseline FHR 110 – 100 bpm

➢ Pathological pattern : Baseline FHR less than 100 bpm

Causes

➢ Hypoxemia

➢ Tissue Hypoxia

➢ Head Compession

➢ Mild partial umbilical cord compression

➢ Maternal hypothermia

➢ Congenital heart block

➢ Local anaesthesitic agents

➢ Narcotic drugs

➢ Physiological in postdated fetus

Baseline tachycardia

- Baseline heart rate more than 150 bpm

- Suspicious pattern : 150 -170 bpm

- Pathological pattern : above 170 bpm

- Baseline tachycardia acceptable in preterm babies

Causes

- Hypoxia

- Maternal fever

- Epidural analgesia

- Drugs (Salbutomol, Ritodrine, atropine)

- Anemia (both mother & fetus)

- Cardiac failure

Incidental tachycardia

Short term tachycardia usually seen after a period of prolonged fetal movement and is normal

Complicated baseline tachycardia

When baseline tachycardia associated with loss of baseline variability and decelerations of any type. This is associated with high suspicious of acidosis.

Wandering baseline

This base line is unstudy and wander between 120 and 160 beats / min (Free man & colleagues 2003)

Rare finding suggestive of a neurologically abnormal fetus may occur as a preterminal event

Baseline variability

It is the oscillation of baseline with in a particular band with including accelerations and decelerations

It is an index of cardiovascular system function. It depends on autonomic nervous system

Grades of Baseline variability
  ➤ Undetectable, absent variability
  ➤ Minimal <5 beats / min variability
  ➤ Moderate (normal) 6 to 25 beats / min variability
  ➤ Marked > 25 beats / min variability
  ➤ Sinusoidal pattern

Sinusoidal heart rate

Regular oscillation of base line resembling a smooth sine wave with 3-5 cycles / min and amplitude of 5-15 bpm above or below baseline, lasting for atleast 10 min. Baseline variability is absent

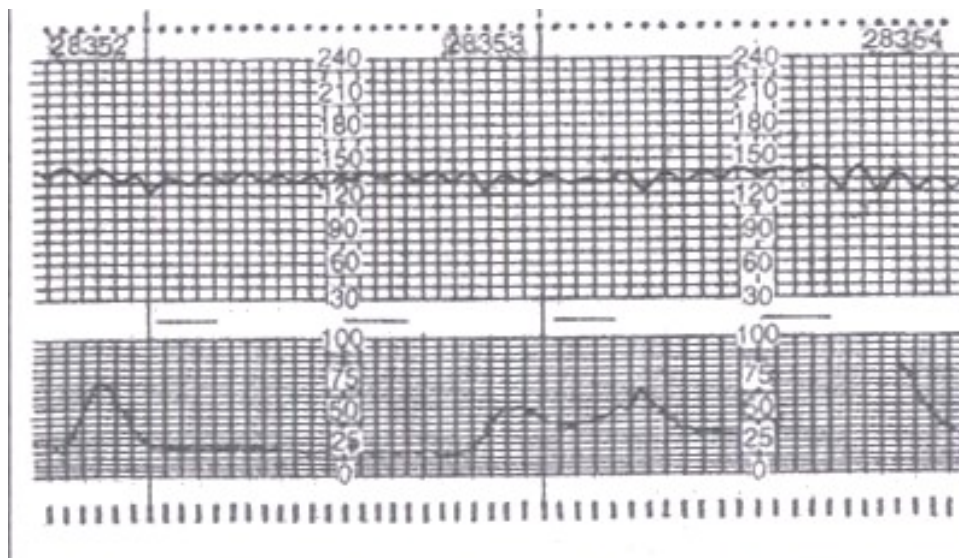**Fig. Sinusoidal Pattern showing absence of beat to beat variability**

Modanlou & Freeman (1982)

> Stable baseline heart rate of 120 to 160 beats / min with regular oscillations

> Amplitude of 5-15 beats / min

> Long term variability frequency of2-5 cycles per min

> Fixed or flat short term variability

> Oscillations of the sinusoidal waveform above (or) below a baseline

> Absence of accelerations

Causes

- Fetal anemia and consequent hypoxia

- Amnionitis

- Fetal distress

- Umbulical cord compession

- Administration of meperidine, morphine, like drugs to mother

Sub types :   **True Sinusoidal**

                   Pseudo sinusoidal

Acceleration

➢ Increases in fetal heart rate by 15 bpm (or) more lasting for at least 15 seconds

➢ Reactive trace : Presence of atleast two accelerations in 20 min periods

➢ Accelerations are considered a good sign of fetal health.

➢ It indicates intact neurohormonal cardiovascular control mechanism

Decelerations

Decrease in fetal heart rate below the baseline by 15 bpm or more lasting for at least 15 seconds.

Types

➢ Early

➢ Late

➢ Variable

Early deceleration

It consists of gradual decrease in fetal heart rate and return to baseline associated with a contraction. It exactly coincides with the contraction. First described by HON (1958). Due to vagal nerve stimulation

Causes : **Mild fetal hypoxia**

Head compression

Late deceleration :

Smooth, gradual, symmetrical decrease in fetal heart rate beginning at or after peak of contraction and returning to baseline only after the contraction is over.

Causes:

- Maternal hypotension

- Supine hypotension

- Severe chronic maternal anemia

- Following epidural block

- Uterine hyperactivity

- Placental insufficiency

Variable Deceleration

Variable Deceleration which are variable in their relation to uterine contraction. Not typically early or late may not occur with each and every contraction

- Vary in the degree of fall of FHR

- Vary in their duration

- Not related to contraction

- Short and sharp episodes characterized by abrupt decrease in fetal heart rate followed by rapid return to base line

Predisposing factors

Short Cord (< 35 cm) : High chance of cord stretching

↓

Variable deceleration

Long Cord (> 80 Cm) : Cord around neck / body

↓

Variable deceleration

Volume of liquor : Oligohydramnios

Decreased Wharton jelly
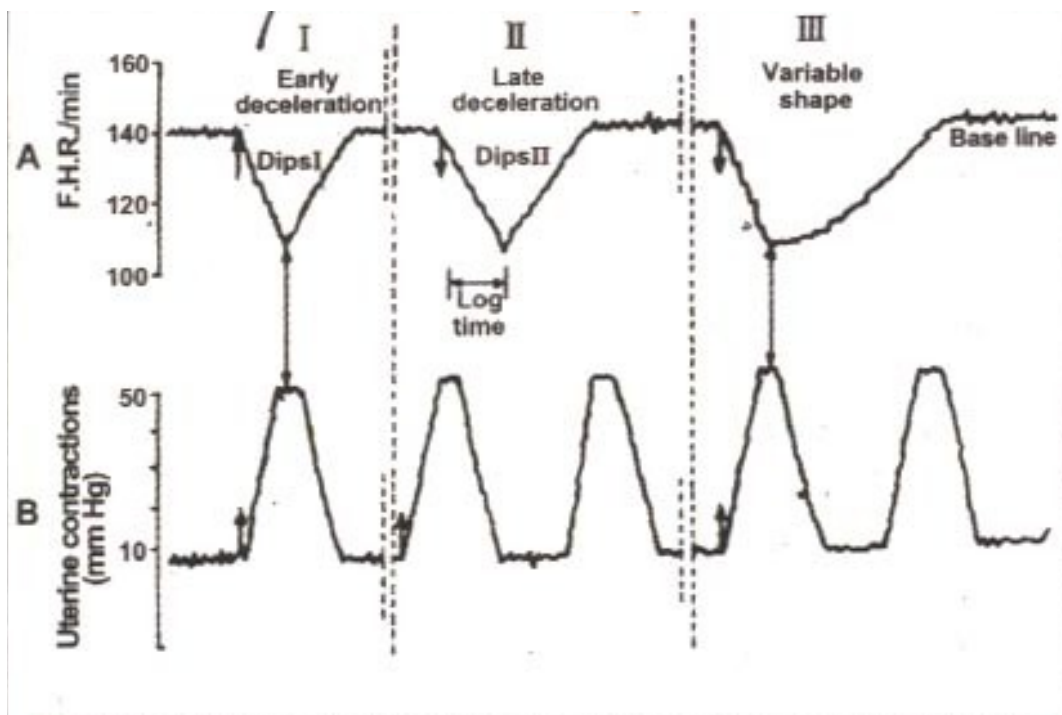
Fig. Graphic representation showing various types of decelerations in relation to uterine contractions
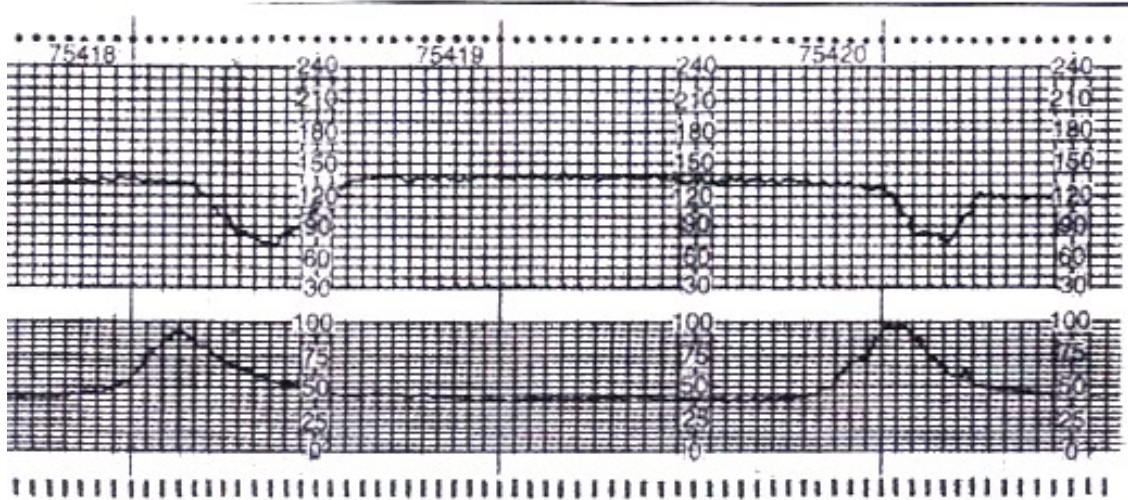
Fig. Persistent late deceleration with loss of variability

Results

AGE GROUP

80
120
600

- 18-20
- 21-29
- 30-35

Parity Distribution

No.of Patients

600
500
400
300
200
100
0

Primary   Secondary

Parity

- No of Patients
- % of Patients
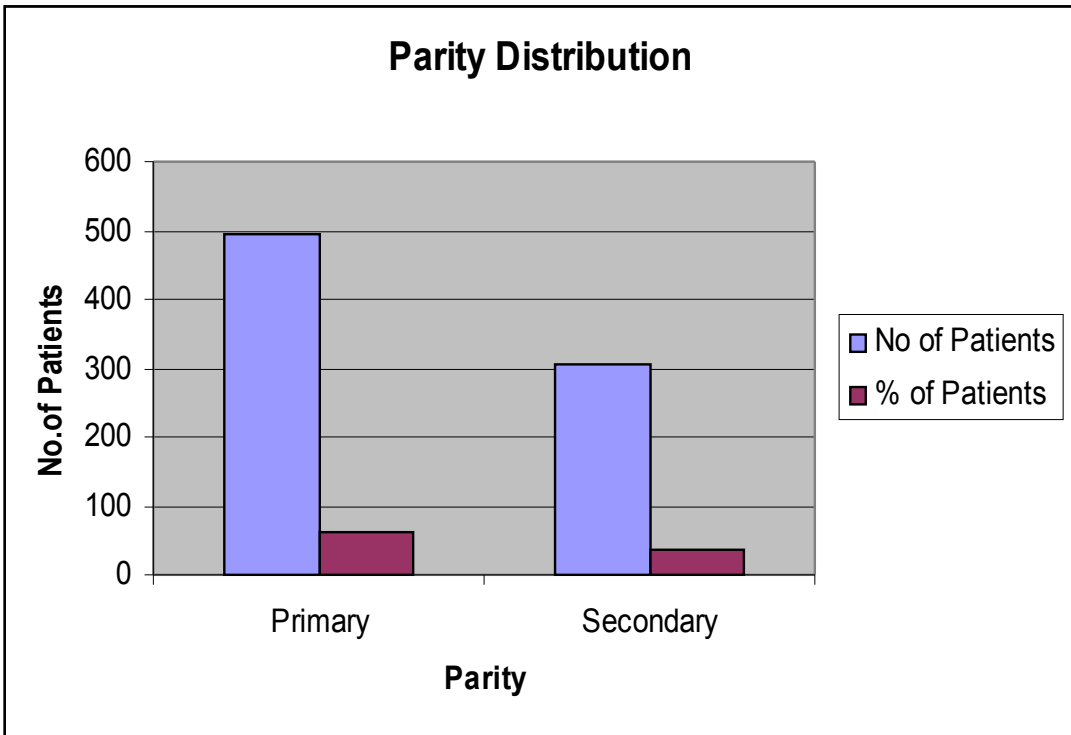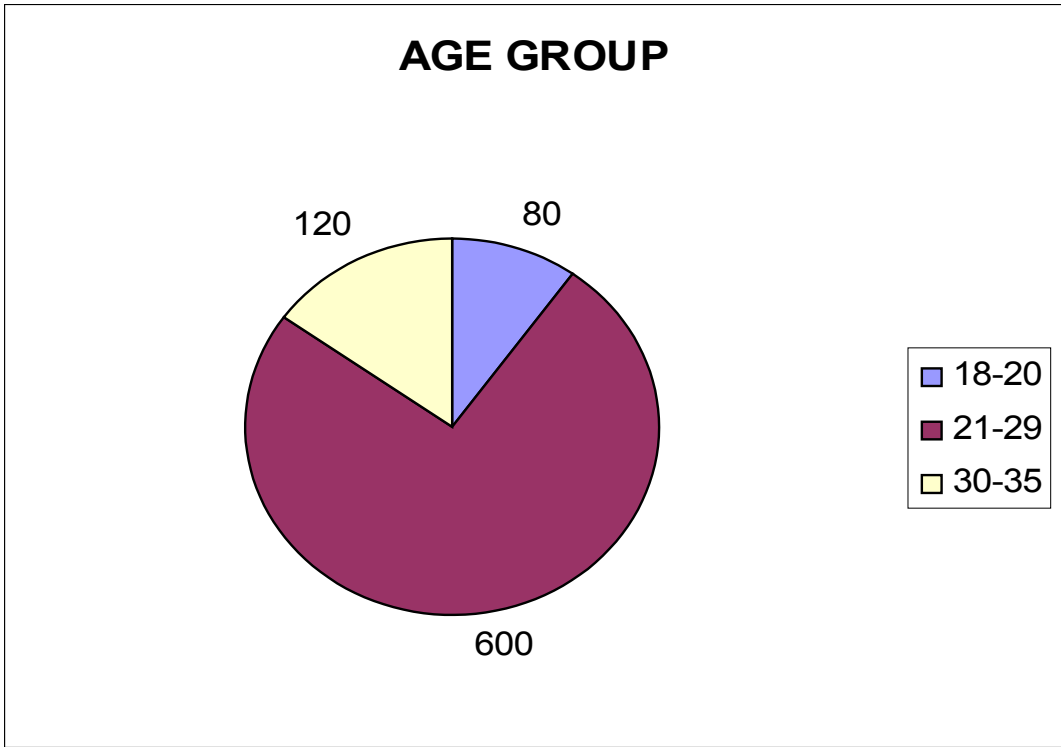
RESULTS

Table 1:

AGE GROUP

AGE IN YEARS	NO OF PTS	PERCENTAGE OF PTS
18-20	80	10
21-29	600	75
30-35	120	15

Table : 2

PARITY DISTRIBUTION

GRAVIDA	NO OF PATIENTS	% OF PATIENTS
Primi	496	62
Second	304	38

Booking status

Admission test trace pattern
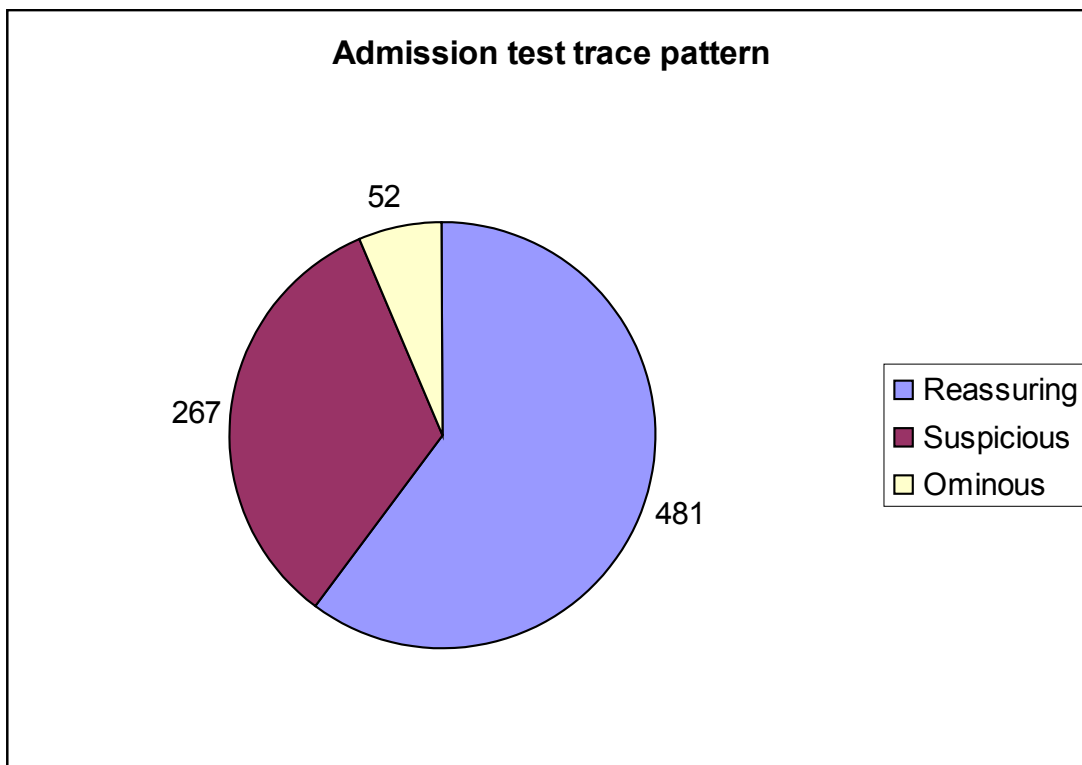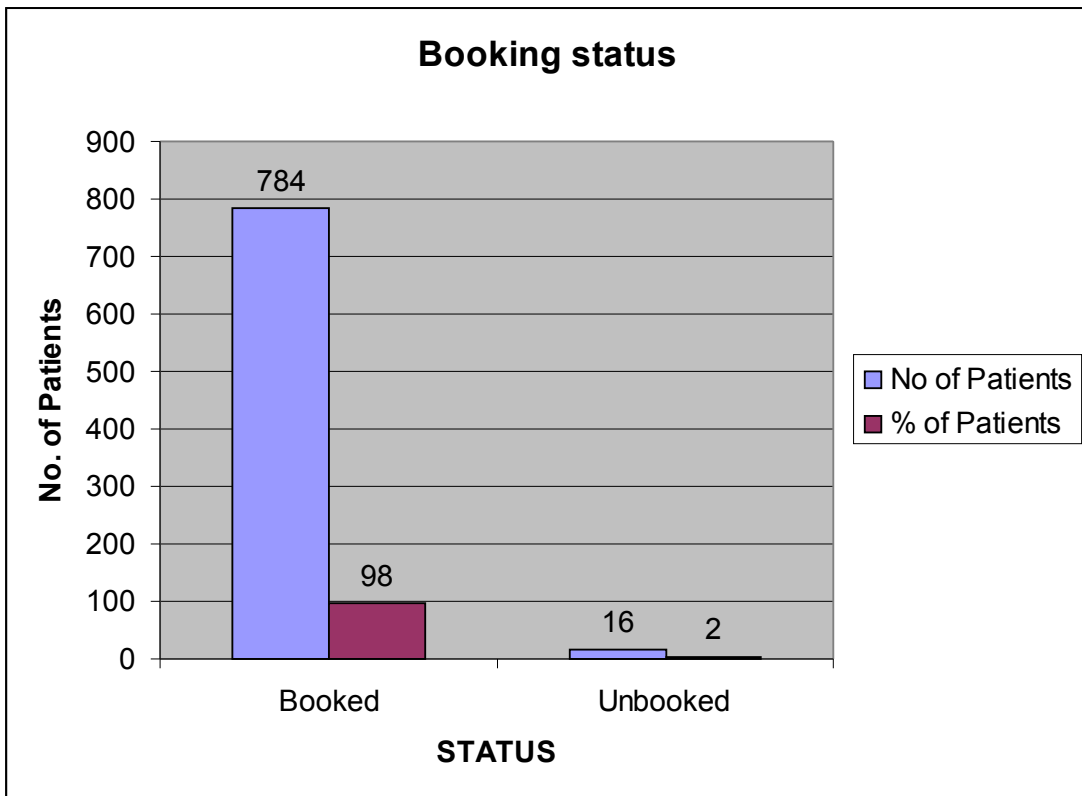
Table :3

BOOKING STATUS

BOOKING STATUS	NO OF PATIENTS	% OF PATIENTS
Booked	784	98
Unbooked	16	2

Table : 4

ADMISSION TEST TRACE PATTERN

TRACINGS	NO OF PATIENTS	% OF PATIENTS
Reassuring	481	60.1
Suspicious	267	33.4
Ominous	52	6.5

Pie chart with segments labeled 319 (High) and 481 (Low). Legend: Low, High.

Type of Labour

Bar chart. Y-axis: NO.OF. PATIENTS (0 to 700). X-axis: TYPE OF LABOUR.

Spontaneous: No of Patients 624, % of Patients 78.
Induced: No of Patients 176, % of Patients 22.

Legend: No of Patients, % of Patients.
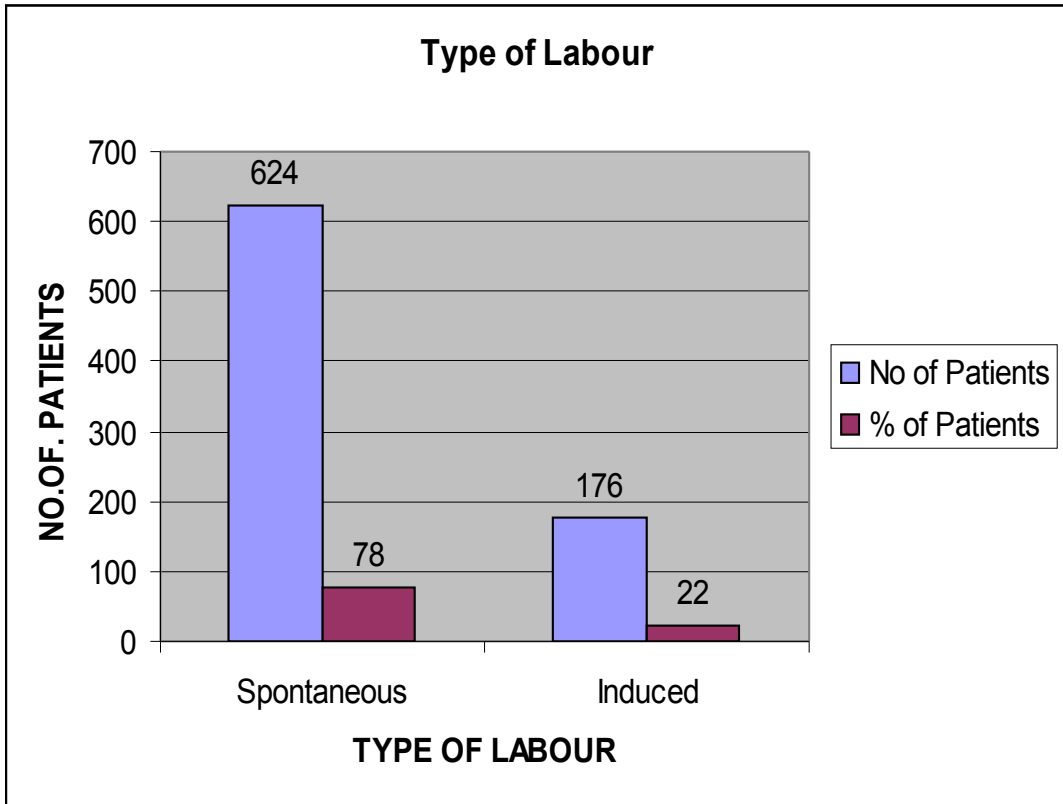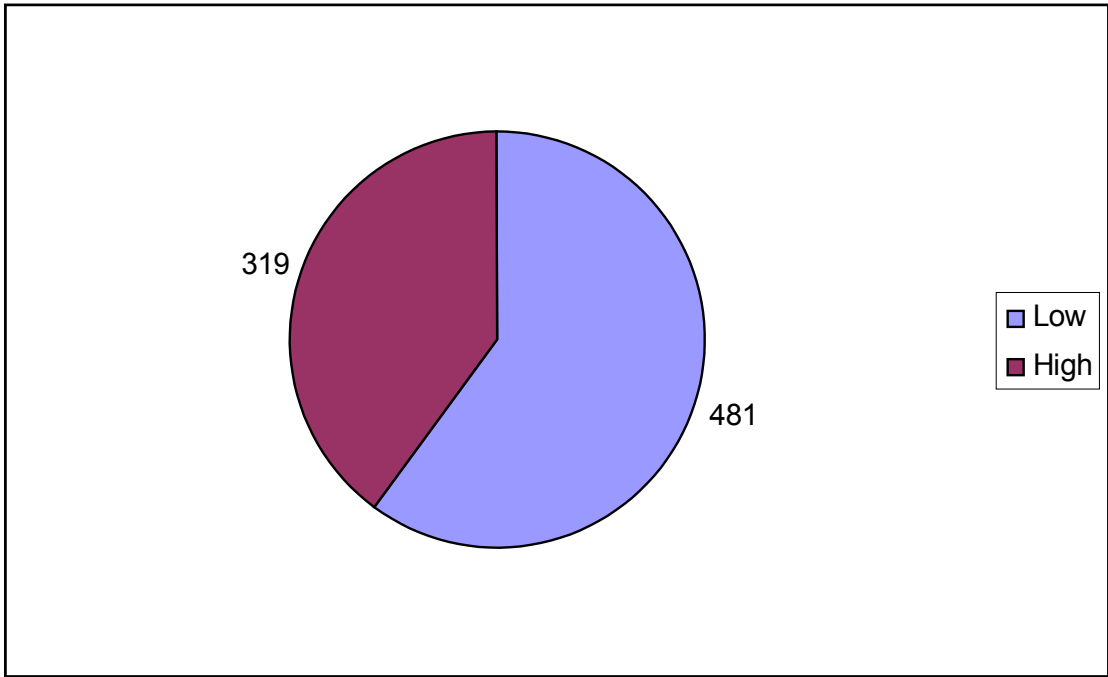
Table : 5

CTG OBSERVATIONAL STATUS

OBSERVATIONAL STATUS	NO OF PATIENTS	% OF PATIENTS
Low	481	60.13
High	319	39.87

Table : 6

TYPE OF LABOUR

TYPE OF LABOUR	NO OF PATIENTS	% OF PATIENTS
Spontaneous	624	78
Induced	176	22
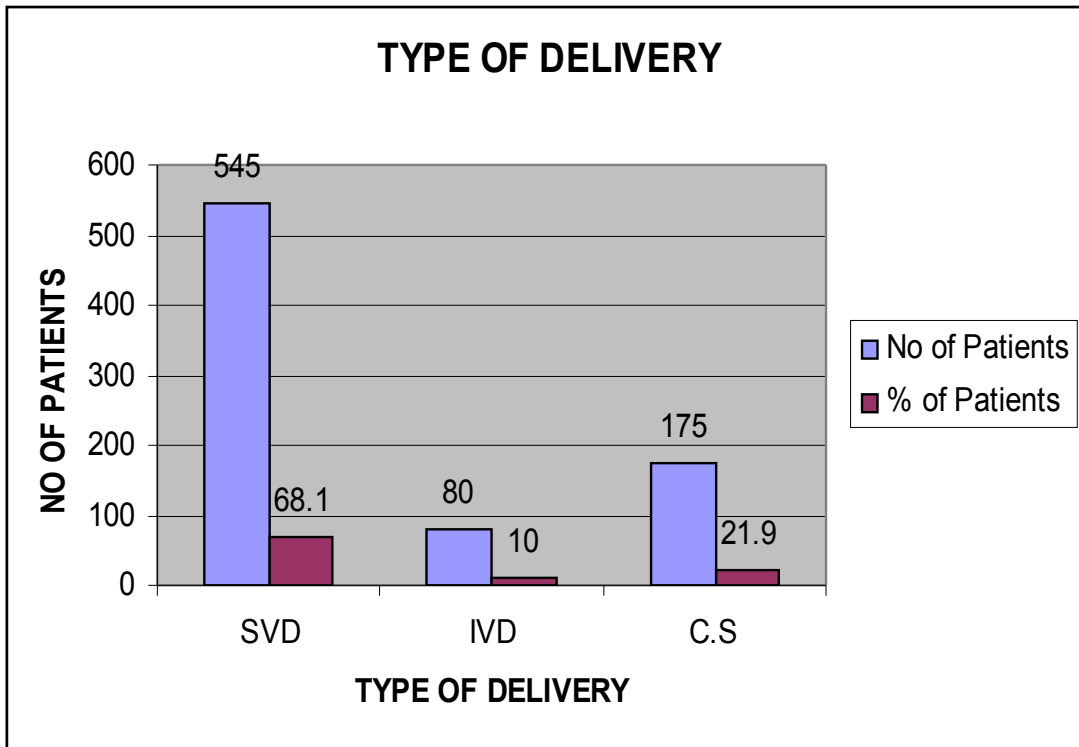
TYPE OF DELIVERY

Table : 7

MODE OF DELIVERY

MODE OF DELIVERY	NO OF PATIENTS	% OF PATIENTS
SVD	545	68.1
IVD	80	10
C.S	175	21.9

Relation between admission test tracings and mode of delivery
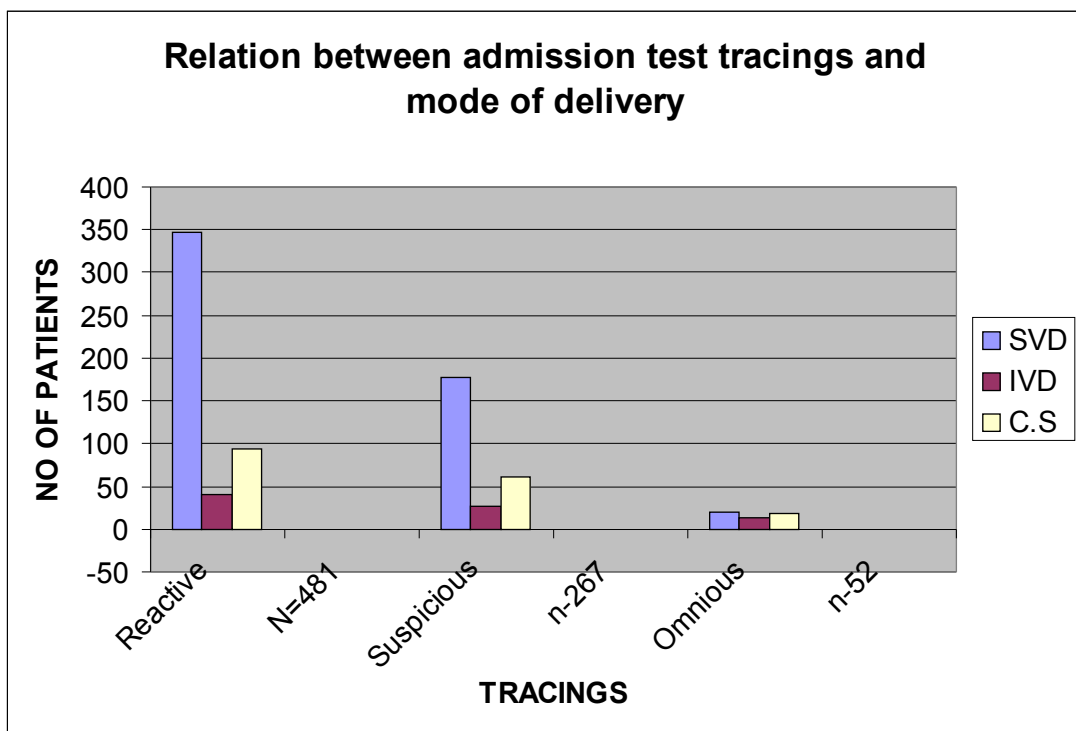
Table : 8

RELATION BETWEEN ADMISSION TEST TRACINGS AND MODE OF DELIVERY

TRACINGS	MODE OF DELIVERY			TOTAL
	SVD	IVD	C.S	
Reactive n=481	347 (43.4%)	40 (5.0%)	94 (11.8%)	481 (60.1%)
Suspicious n-267	178 (22.3%)	27 (3.4%)	62 (7.8%)	267 (33.4%)
Omnious n-52	20 (2.5%)	13 (1.6%)	19 (2.4%)	52 (6.5%)
Total	**545 (68.12%)**	**80 (10%)**	**175 (21.88%)**	**800 (100%)**

As per reason Chi-Square test P value = 0.000 since "p" value is less than 0.05 there is a significant correlation between type of tracings and mode of delivery.

Between Gravida & Type of Labour

Type of Labour Vs Mode of Delivery
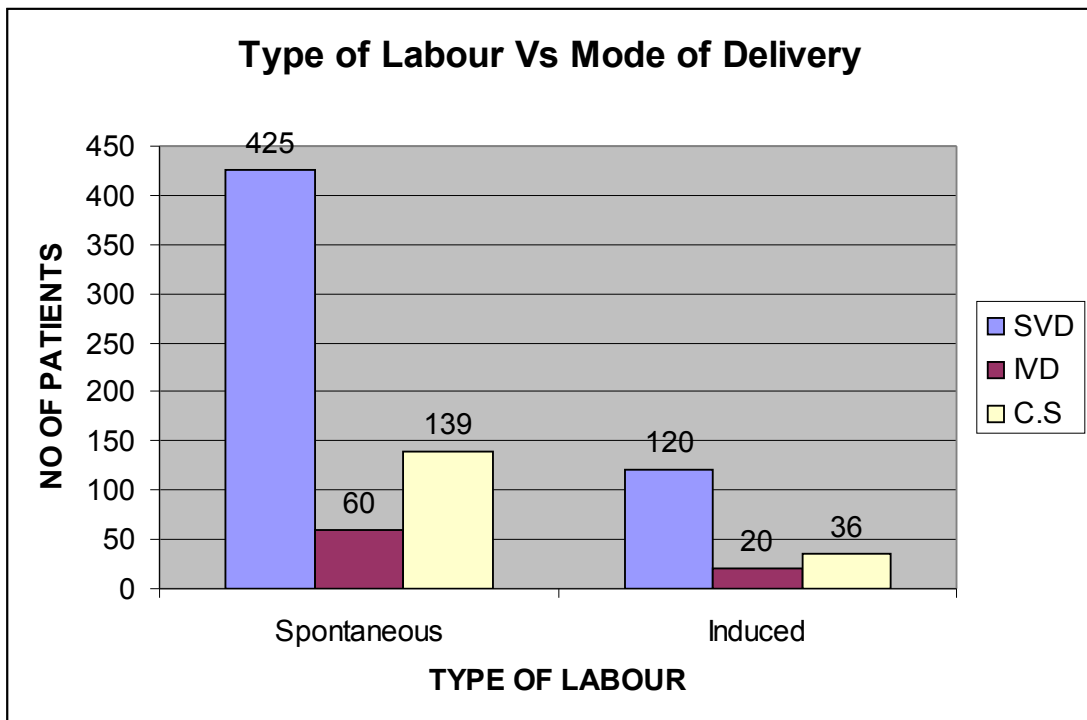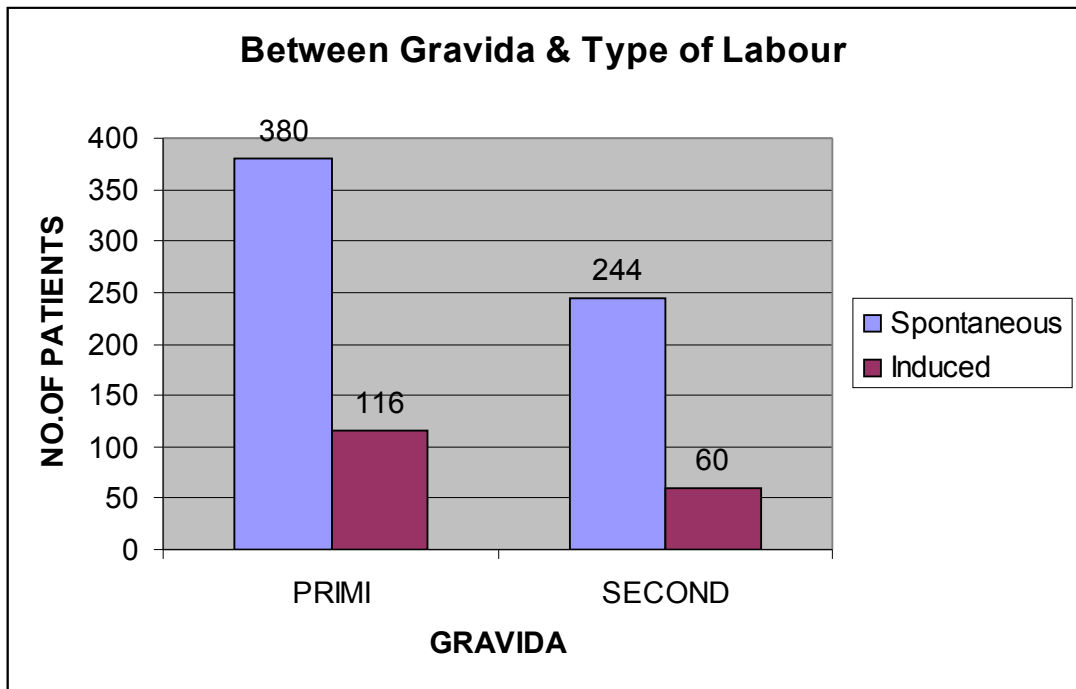
Table : 9

BETWEEN GRAVIDA & TYPE OF LABOUR

GRAVIDA	TYPE OF LABOUR		TOTAL
	SPONTANEOUS	INDUCED	
Primi	380 (47.5%)	116 (14.5%)	496 (62%)
Second	244 (30.5%)	60(7.5%)	304 (38%)
Total	**624 (78.0%)**	**176 (22.0%)**	**800 (100.0%)**

As per chisquare test p value = 0.226 statistically no significant relationship exists between Gravida & Type of Labour

Table : 10

TYPE OF LABOUR VS MODE OF DELIVERY

TYPE OF LABOUR	MODE OF DELIVERY		
	SVD	IVD	C.S
Spontaneous	425 (53.1%)	60 (7.5%)	139 (17.4%)
Induced	120 (15.0%)	20 (2.5%)	36 (4.5%)

P value = 0.731 since p value > 0.05 there is no significant relationship between type of labour and mode of delivery.

GRAVIDA Vs MODE OF DELIVERY
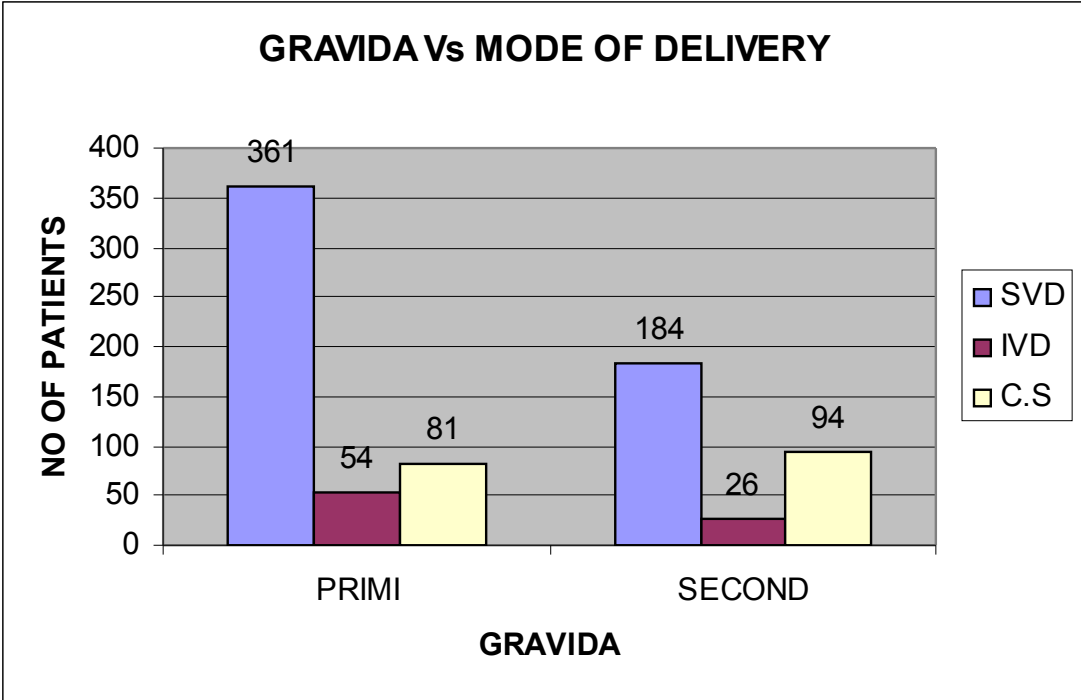
Table : 11

GRAVIDA Vs MODE OF DELIVERY

GRAVIDA	MODE OF DELIVERY			TOTAL
	SVD	IVD	C.S	
PRIMI	361 (45.1%)	54 (6.8%)	81 (10.17%)	496 (62.0%)
SECOND	184 (23.0%)	26 (3.3%)	94 (11.8%)	304 (38.0%)
TOTAL	**545 (68.1%)**	**80 (10.0%)**	**175 (21.9%)**	**800 (100.0%)**

As per Chi Square test p value = 0.000 so the association between these two variables is statistically significant

APGAR SCORE
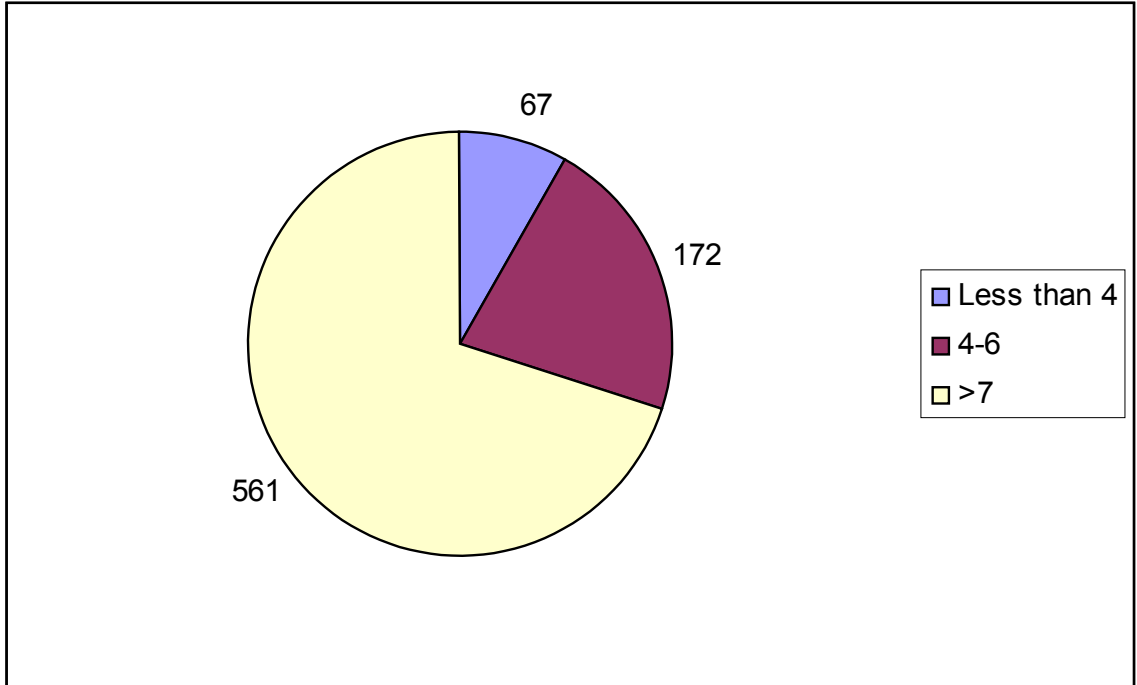
FETAL OUTCOME
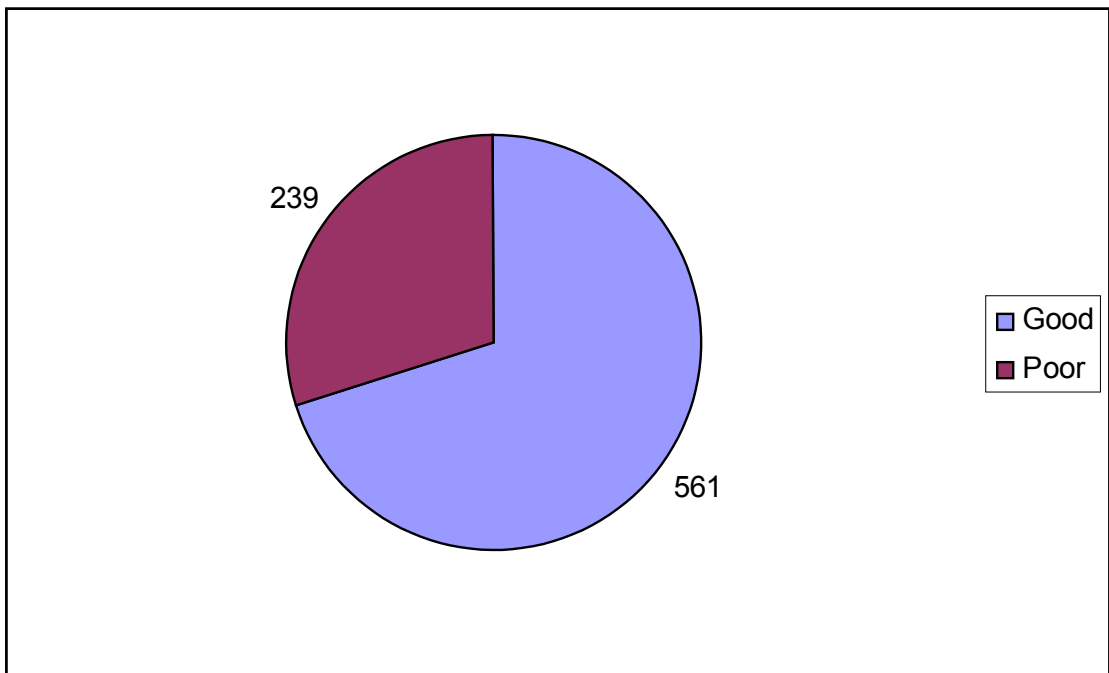
Table : 12

APGAR SCORE

APGAR SCORE	NO	PERCENT
Less than 4	67	8.4%
4-6	172	21.5%
More than 7	561	70.1%

Table : 13

FETAL OUTCOME

FETAL OUTCOME	NO	PERCENT
Good	561	70.1%
Poor	239	29.9%

Admission test tracings Vs Apgar Score

Legend: <4, 4-6, >7

Reactive: 12, 59, 410
Suspicious: 30, 98, 139
Omnious: 25, 15, 12

X-axis: **Admission Test Tracings**
Y-axis: **No of Patients**
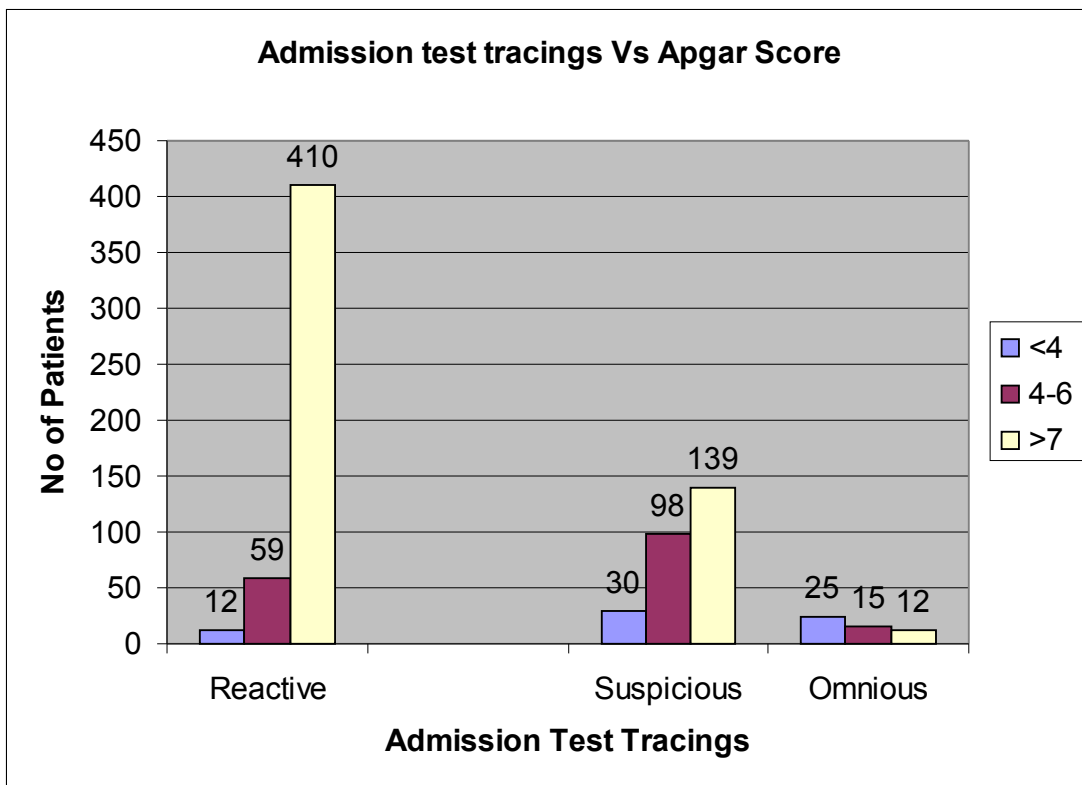
Table : 14

ADMISSION TEST TRACINGS VS APGAR SCORE

ADMISSION TEST TRACINGS	APGAR			TOTAL
	<4	**4-6**	**>7**	
Reactive	12 (1.5%)	59 (7.4%)	410 (51.3%)	481 (60.1%)
Suspicious	30 (3.8%)	98 (12.3%)	139 (17.4%)	267 (33.4%)
Omnious	25 (3.1%)	15 (1.9%)	12 (1.5%)	52 (6.5%)
Total	**67 (8.4%)**	**172 (21.5%)**	**561 (70.1%)**	**800 (100.0%)**

p value = 0.002

Since p value is < 0.05, there is a statistically significant correlation between admission test tracings and Apgar.

Admission test tracings vs Fetal outcome

Chart showing No. of Patients (y-axis, 0 to 450) vs Admission Test Tracings (x-axis: Reactive, Suspicious, Omnious) with Good and Poor categories.

Reactive: Good 410, Poor 71
Suspicious: Good 139, Poor 28
Omnious: Good 12, Poor 40
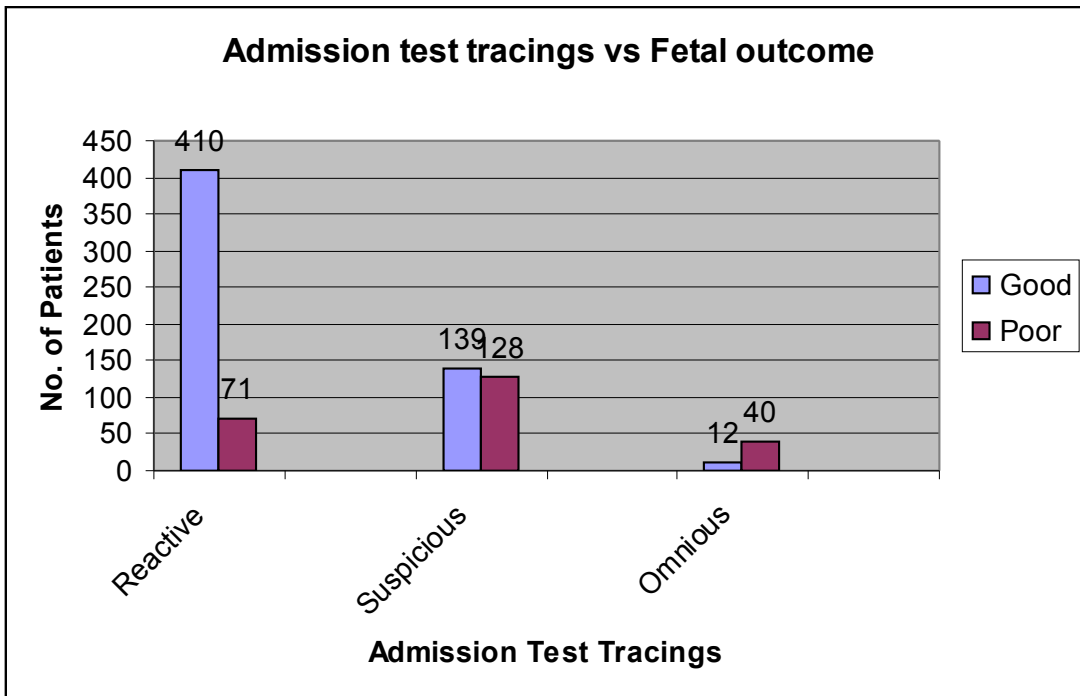
Table :15

ADMISSION TEST TRACINGS VS FETAL OUTCOME

ADMISSION TEST TRACINGS	FETAL OUTCOME		TOTAL
	GOOD	POOR	
Reactive	410 (51.3%)	71 (8.9%)	48 (60.1%)
Suspicious	139 (17.4%)	128 (16.0%)	267 (33.4%)
Omnious	12 (1.5%)	40 (5.0%)	52 (65.0%)
Total	**561 (70.1%)**	**239 (29.9%)**	**800 (100.0%)**

As per Pearson Chi-square test p value = 0.002. Abnormal CTG tracings are associated with poor fetal outcome than Reactive Tracings.

MODE OF DELIVERY AND APGAR
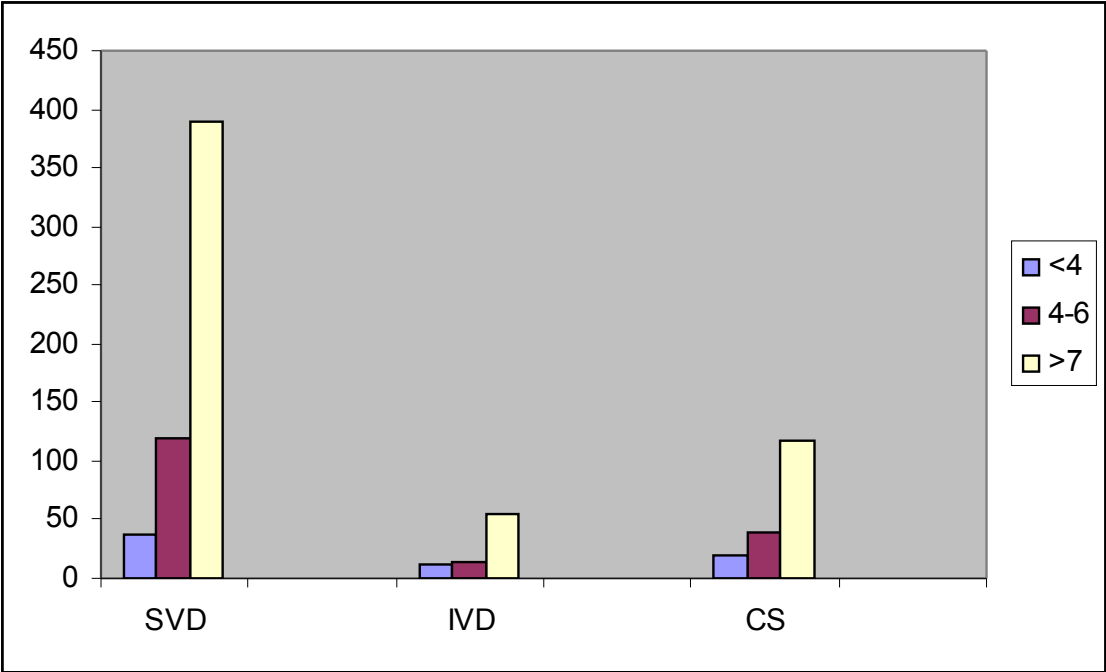
Table : 16

MODE OF DELIVERY AND APGAR SCORE

MODE OF DELIVERY	APGAR			TOTAL
	<4	**4-6**	**>7**	
SVD	37	119	389	545
	(4.6%)	(14.9%)	(48.6%)	(68.1%)
IVD	11	14	55	80
	(1.4%)	(1.8%)	(6.9%)	(10.0%)
CS	19	39	117	175
	(2.4%)	(4.9%)	(14.6%)	(21.9%)
TOTAL	**67**	**172**	**561**	**800**
	(8.4%)	**(21.5%)**	**(70.1%)**	**(100.0%)**

As per chi-square test P value = 0.149

MODE OF DELIVERY AND FETAL OUTCOME

BIRTH WEIGHT

Table : 17

MODE OF DELIVERY AND FETAL OUTCOME

MODE OF DELIVERY	FETAL OUTCOME		Total
	GOOD	POOR	
SVD	389 (48.6%)	156 (19.5%)	545 (68.1%)
IVD	55 (6.9%)	25 (3.1%)	80 (10.0%)
CS	117 (14.6%)	58 (7.3%)	175 (21.9%)
TOTAL	561 (70.1%)	239 (29.9%)	800 (100.0%)

As per chi-square test P value = 0.054

Table : 18

BIRTH WEIGHT

BIRTH WEIGHT	FREQUENCY	PERCENT
2.4 -2.7	349	43.62
2.8-3.1	245	30.63
3.2-3.4	206	25.75

BIRTH WEIGHT AND MODE OF DELIVERY
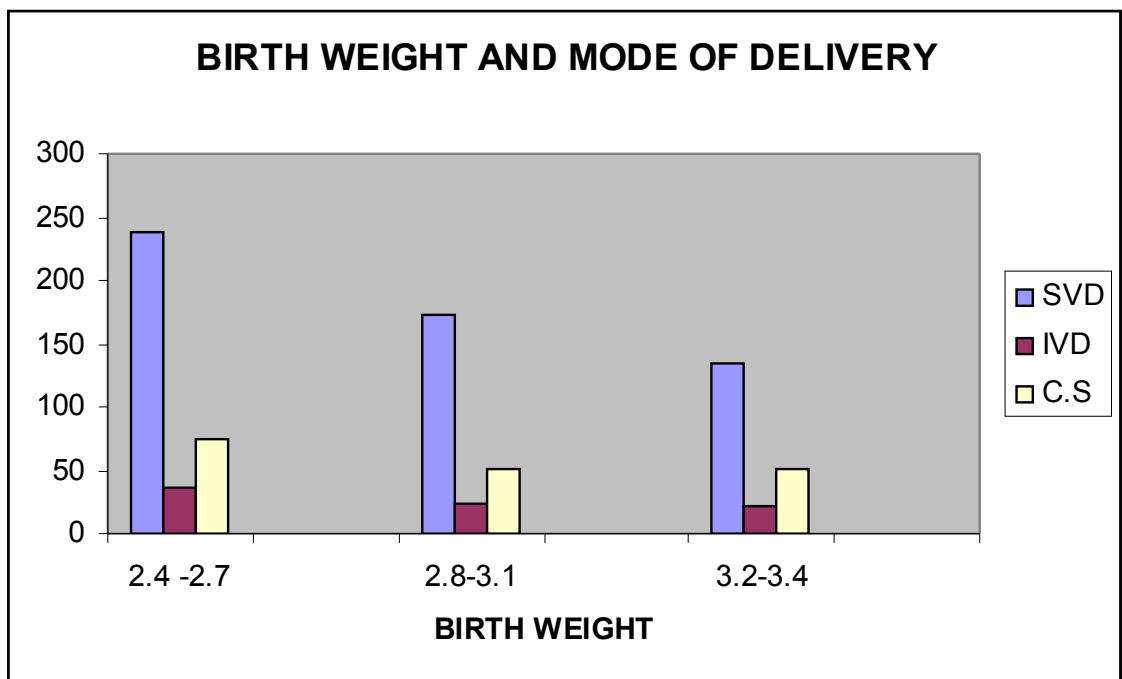
BIRTH WEIGHT

Table : 19

BIRTH WEIGHT AND MODE OF DELIVERY

BIRTH WEIGHT (Kg)	MODE OF DELIVERY			TOTAL
	SVD	IVD	C.S	
2.4 -2.7	239 (29.8%)	36 (4.5%)	74 (9.25%)	349 (43.62%)
2.8-3.1	172 (21.5%)	23 (2.87%)	50 (6.25%)	245 (30.63%)
3.2-3.4	134 (16.75%)	21 (2.62%	51 (6.38%)	206 (25.75%)
Total	545 (68.13%)	80 (10%)	175 (21.87%)	800 (100.0%)

As per chi-square test P value =   0.996

TABLE BIRTH WEIGHT AND APGAR SCORE
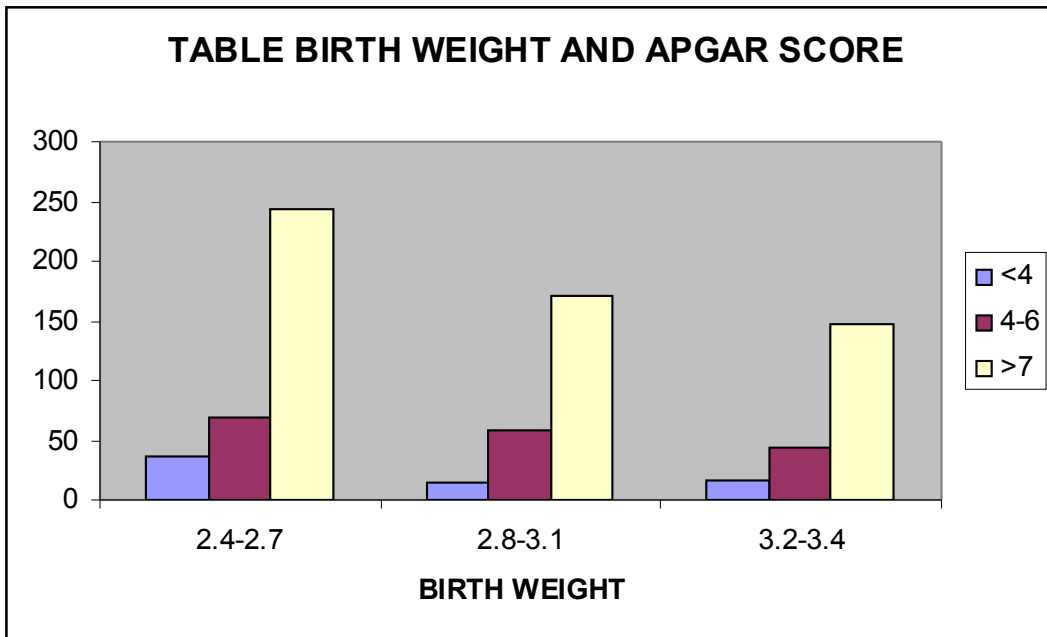
Table : 20

BIRTH WEIGHT AND APGAR SCORE

BIRTH WEIGHT	APGAR			TOTAL
	<4	4-6	>7	
2.4-2.7	36	70	243	349
	(4.5%)	(8.75%)	(30.38%)	(43.62%)
2.8-3.1	15	59	171	245
	(1.88%)	(7.38%)	(21.38%)	(30.63%)
3.2-3.4	16	43	147	206
	(2%)	(5.38%)	(18.38%)	(25.75)
Total	67	172	561	800
	(8.38%)	(21.5%)	(70.12%)	(100.0%)

As per chi-square test P value   =   0.074

BIRTH WEIGHT AND FETAL OUTCOME
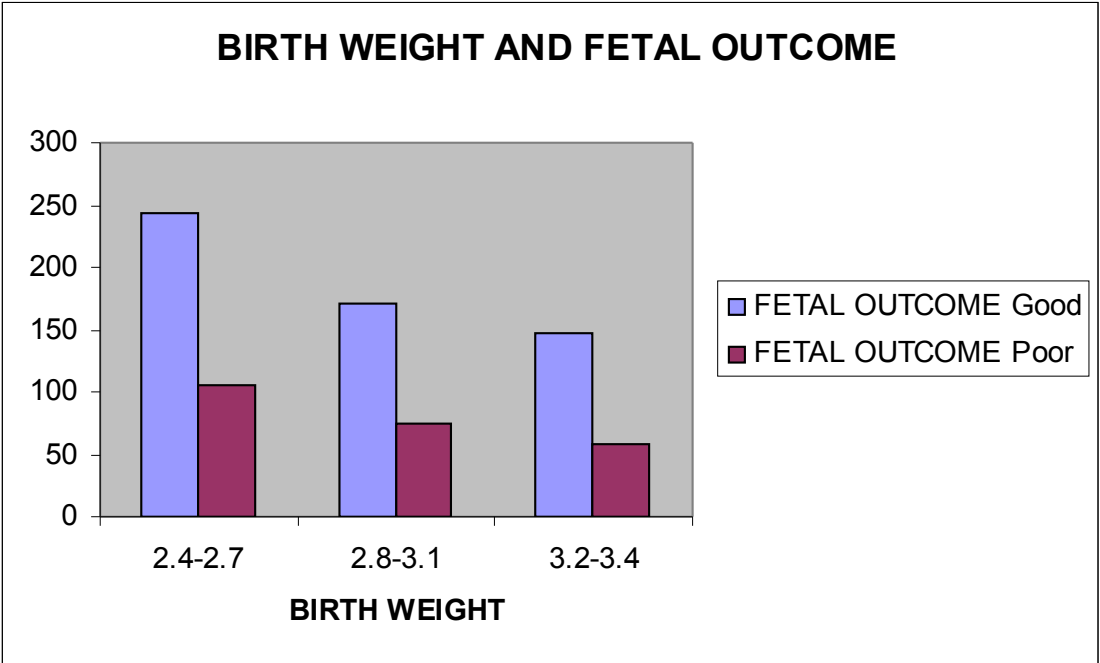
Table : 21

BIRTH WEIGHT AND FETAL OUTCOME

BIRTH WEIGHT (Kg)	FETAL OUTCOME		TOTAL
	GOOD	POOR	
2.4-2.7	243 (30.38%)	106 (13.25%)	349 (43.63%)
2.8-3.1	171 (21.38%)	74 (9.25%)	245 (30.62%)
3.2-3.4	147 (18.38%)	59 (7.38%)	206 (25.75%)
Total	561 (70.13%)	239 (29.87%)	800 (100.0%)

As per chi-square test P value   =   0.871

Table : 22

ADMISSION TEST EVALUATION

Sensitivity   :   70.29%

Specificity   :   73.08%

Positive Predictive Value   :   52.66%

Negative Predictive Value   :   85.24%

Diagnostic Accuracy   :   72.25

Discussion

DISCUSSION

In this study, 800 antenatal women were included. Majority of the antenatal women were primi, belonging to the age group 21-29 years. This is in accordance with more pregnancies in particular age group.

Regarding booking status of the patients (Table 3) In this study, 98% (n-784) of AN women were booked. Only 2% (n-16) were unbooked. Most of the unbooked patients were second gravida. Booking status has no significance in this study.

Discussion on Table 4:

In this study, out of 800 a women 481 (60.1%) of patients had reactive admission test tracings. 33.4% (n-267) were belonged to suspicious tracings group and 6.5% (n-52) were belonged to ominous group.

In 2002, **Kasthugai P, Narogoni. S.** conducted a study on Admission test – an effective risk screening tool with 500 patients. The tracings were : 86.6% (n-433) had reactive 7.4% (n-37) were belonged to suspicious group and 0.6% (n-30) were belonged to ominous.

In Kandan Karibu Hospital, Singapore (1998), a study was conducted in 1000 Antenatal women for admission test in high and low –

risk pregnancy. The tracings were reactive 982 (4.3%) suspicious 49 (4.7%) and ominous 10 (1%)

The CTG observational status of Antenatal women (Table 5) :

In this study 481 (60.13%) patients belonged to Low observational status, 319 (39.81%) belonged to high observational status. The continuation of change over status patients will be discussed later.

Type of Labour : (Table - 6)

In the present study, 78% of labours were spontenaous on set (n-624). Only 22% were induced type (n-176).

Discussion on Table 8:

Macdonald et al conducted a randomized trial on admission cardiotocography in 1000 antenatal women (1985). Mode of delivery among them: SVD – 31% IVD – 9% C.S. 60%. Most of the caesarean deliveries occurred in abnormal CTG group. They found a statistically significant relation between non – reactive tests & increased incidence of IVD and C.S . (P < 0.05)

Ingemarsson et al (1986) carried out a study in 1000 AN women on efficacy of admission test in predicting neonatal outcome, their mode of delivery. SVD 45% IVD – 6% and C.S. 49%. They also found that

abnormal admission test tracings were associated with increased caesarean delivery than reactive tracings group (p < 0.04)

In a study conducted by **Vinitha Das, G.K. Malik** in 170 AN women on efficacy of admission test in predicting fetal jeopardy in labour, 60.97% of the abnormal tracings group had cesarean delivery. In reactive tracings group only 45.7% of patients had cesarean delivery. They observed a significant relation between admission test tracings and mode of delivery (p value – 0.04)

In this study, mode of delivery among 800 AN women; 68.1 % - SVD, 10% - IVD, 21.9% - CS. On comparing admission test tracings with mode of delivery, Only 19.5% (n-94) of the reactive group had cesearean delivery, but 23.22% (n-62) of suspicious and 36.53% (n-19) of the ominous group had caesarean delivery. This showed that abnormal tracings were associated with increased incidence of caesarean delivery than reactive tracings (p<0.05)

Kidd LC, Patel NB, Smith R did a randomized clinical trial on non stress antenatal cardiography in 396 AN women in 1985. They found that caesearan delivery rates were almost same in both reactive and non reactive tracings hence they concluded that availability of non stress cardiotocography was not associated with increased labor induction (or) caesarean section.

Discussion on Table 9:

In this study when gravida and type of labor were analysed there was no significant association between them. (p = 0.245). In a study by **Mires G, Willians et al** (2000) on admission test in low risk obstetric population, most of the second gravida were delivered by labor natural of spontaneous onset when they were anlaysed. There occurred significant association (p < 0.01).

Discussion on Table 10:

In this study primi : out of 496 women, 361 were delivered by Normal vaginal delivery, 54 were by Instrumental vaginal delivery and 81 were by caesarean section. Among second gravida (n-304), 184 patients delivered naturally, 26 patients delivered by Instrumental vaginal delivery and 94 were delivery by Cesearean section. Since p value 0.000, the relation between these two is statistically significant.

In a study conducted by **Nidhikatya** (2000) in 1000 An women, no association existed between parity and mode of delivery (p=0.226)

Discussion on Table 14:

Atul K. Sood did a study in 500 a women on evaluation of non stress test in low risk pregnancy. They found that 5 min apgar score < 7 and neonatal admission's were more commonly Associated with non reactive tracings than reactive tracings ($p < 0.005$)

Sandal J. et al and **Gourounti** did a study on effect of admission test on rate of C.S, instrumental vaginal delivery and neonatal apgar score. The relative risk for having a caesarean delivery (RR 1.2 C.I. 1.00 – 1.41) and instrumental delivery (RR 1% CI 1.00 – 1.18) were both high in abnormal tracings group. Similarly the relative risk for low apgar (<7 at 5 min) was also high in abnormal tracings group(RR 1.35 C.I 0.85 – 2.13). They concluded that abnormal (suspicious & ominous) admission test tracings were associated with increased risk of instrumental vaginal delivery and caesarean section and low 5 min apgar score.

Fawole AO, Sotiloye OS, did a study on antenatal cardiotocography in 300 AN women in Nigeria. They analysed that low apgar <7 occurred most commonly in non reactive tracings ($p = 0.04$). Reactive test was associated with 3 fold reduction in the incidence of low apgars compared with Non reactive.

In 1989 **Manterola Alvarez D, Angeles Weintraub** conducted a study on admission test and perinatal outcome. They found a statistical

significant correlation between suspicious and ominous tracings and fetal condition at birth (Apgar < 7) p = 0.01

Pattison N, Mccowan L did a study to assess the effects of antental cardiotocography on perinatal morbidity and mortality in 2000. No significant correlation existed between type of tracings and perinatal morbidity and mortality (p=0.18)

In 1984, a randomized controlled trial was conducted on admission test by **Kidd LC, Smith R**. In their study, they observed that frequency of intrapartum fetal distress and low apgar score were similar in both reactive and abnormal tracings group.

In this study 40 babies of ominous tracings group 128 babies of suspicious group had apgar score <7. But only 71 babies of the, reactive tracings group had low apgar score (<7) . So abnormal tracings had 2 fold increased risk of having low apgar score then reactive tracings. (p value 0.002)

Discussion on Table 15:

Fawole A.O, Sotiloye OS did a study on antenatal cardiotocography (2007) in 150 AN women. They found that non reactive test was strongly associated with poor fetal outcome (p=0.04). They concluded that antenatal cardiotocography can be used in low resource settings for improving perinatal care.

Manterola Awarez, Angeles Weintraub did a study on Admission test and fetal outcome (1989). They took 600 Antenatal patients, observed that non reactive tracings were significantly associated with increased risk of instrumental vaginal delivery, Caesarean section and poor fetal outcome than reactive tracings group (p=0.03)

Pattison N, Mc Cowan L did a study to asses the effects of cardiotocography on perinatal morbidity and mortality. They noted, no significant effect of antenatal cardiotocography on perinatal outcome (p =0.14).

In the study conducted by **Kidd LC**, **Smith R** on Antenatal cardiotocography in 396 antenatal patients (1985) there was no difference in fetal outcome of reactive and non reactive group.

Murphy J, Sheilo did a randomized controlled trial on Admission cardiotography in 8000 antenatal women (2002) They observed no difference in fetal outcome between usual care group and admission cardiotocography (R R 1.01 95%, C.I > 0.70 – 1.47). They concluded that routine use of cardiotocography for 20 min on admission to delivery does not improve fetal outcome.

In this study, when admission test tracings and fetal outcome were analysed the results showed that abnormal tracings associated with poor fetal outcome, than reactive tracings (p=0.002).

In this study, 4% (n=21) antenatal women, who were initially in Low observational status switch over to high observational status later. The repeat tracings of CTG change over status patients.

Low Observational Status	High Observational Status	%
502	21	4%

CTG Change over status	Tracings	No	%
N=21	Suspicious	17	80.95
	Omnious	4	19.04

MODE OF DELIVERY

TRACINGS		NO	%
Suspicious (n=17)	SVD	8	47.05
	IVD	4	23.52
	C.S.	5	29.41
Omnious (N = 4)	SVD	-	-
	IVD	1	25
	C.S	3	75

FETAL OUTCOME

ADMISSION TRACINGS	GOOD FETAL OUTCOME	POOR FETAL OUTCOME
Suspicious (n=17)	10	7
Omnious n=4	1	3

IN THIS STUDY, DIAGNOSTIC (OR) SCREENING TEST EVALUATION SHOWS : (TABLE 22)

- ➢ Sensitivity 70.29%

- ➢ Specificity 73.08%

- ➢ Positive Predictive value 52.66

- ➢ Negative predictive value 85.24

- ➢ Diagnostic accuracy 72.25%

In a study conducted by **Atul K. Sood** in 2002 on admission test showed

- ➢ Sensitivity   41%
- ➢ Specificity   94%
- ➢ PPV   83%
- ➢ NPV   72%
- ➢ Diagnostic accuracy   74%

In 2001, **Vinitha Das** conducted a prospective randomized study on efficacy of admission test in predicting fetal distress. She observed

Sensitivity   38%
Specificity   79%
PPV   48%
NPV   72%

In a study conducted by **Kushtagi P** (2002) on labor admission test showed

Sensitivity   53%
Specificity   93%
PPV   61%
NPV   91%

The values obtained in the present study compares favourably with the values of other studies, indicating that reactive admission test correlates well with fetal well-being.

Summary & Conclusion

SUMMARY AND CONCLUSION

The present study was carried out at **Institute of Social obstetrics and Govt. Kasturba Gandhi Hospital, Chennai** from April 2007 to April 2008, to analyze the efficacy of admission test as a predictor of observational status for women in early labor.

In settings with restricted man power and qualified staff, there is always a need to differentiate the patients who require constant monitoring and those who could be monitored less frequently. However, this differentiation could be arrived at only after an initial screening and such bifurcation.

In this study, 800 AN women who were admitted to the labor ward of this tertiary care centre were selected based on the inclusion and exclusion criteria and after obtaining informed consent, all of them were subjected to a 20 minute admission test. Based on the findings of the admission test, they were divided into low observational staus (Reactive tracing) and high observational status (suspicious and/or ominous tracings). The onset, duration and mode of delivery along with the maternal and fetal outcome were analysed.

The study shows that there is a good correlation between reactive tracings and good fetal outcome even with less frequent monitoring. Hence the admission test can be used as an useful tool to differentiate between these two categories of women in early labor to maximally utilize the available limited man power.

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Proforma

PROFORMA

NAME

AGE

IP NO.

GRAVIDA   PARA

LMP

                                                    EDD

DOA

TYPE OF CASE   :   BOOKED

                                                    UNBOOKED

CLINICAL EXAMINATION

ADMISSION TEST TRACING : (a) Reactive (b) Suspicious (c) Omnious

CTG OBSERVATIONAL STATUS OF AN WOMEN : (a) Low (b) High)

TYPE OF LABOR : a) Spontaneous (b) Induced

MODE OF DELIVERY : (a)   SVD   (b) IVD   (c) CS

DATE OF DELIVERY

COMPLICATIONS DURING DELIVERY   (a) Yes   (b) No

BABY DETAILS

        (a) Live birth

        (b) Sex of baby

        (c) Wt of baby

        (d) Apgar 5 min

        (e) Congenital anomalies

        (f) Fetal Death

             Cause

             Death after No. of days

STATUS AT DISCHARGE

    MOTHER

    BABY

Abbreviations

ABBREVIATIONS

TOL -   Type of Labour

MOD -   Mode of delivery

SVD -   Spontaneous vaginal delivery

IVD -   Instrumental Vaginal delivery

CS   -   Caesarean section

BW   -   Birth Weight

FO   -   Fetal Outcome

Master Chart

Admission
Test Tracings