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"TO EVALUATE THE ASSOCIATION OF HYPERLIPIDEMIA IN PRETERM DELIVERY"

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INSTITUTE OF SOCIAL OBSTETRICS,

GOVT KASTURBA GANDHI HOSPITAL,

MADRAS MEDICAL COLLEGE & HOSPITAL.

APRIL 2012

CERTIFICATE

This is to certify that the dissertation entitled **"TO EVALUATE THE ASSOCIATION OF HYPERLIPIDEMIA IN PRETERM DELIVERY"** presented herein by **Dr.S.SOWMIYA** , is an original work done in the Department of Obstetrics & Gynaecology , **Institute of Social Obstetrics and Government Kasturba Gandhi Hospital** , Government Madras Medical College , Chennai, in partial fulfilment of regulations of the Tamil Nadu Dr.M.G.R.Medical University for the award of degree of M.D.(Obstetrics &Gynaecology) , under my guidance and supervision during the academic period 2009-2012

Prof.Dr.V.KANAGASABAI. M.D.,
The Dean,
Government Madras Medical College
Chennai.

Prof.Dr.P.M.GOPINATH, M.D,DGO
Director,
The Institute of Social Obstetrics
and Govt. Kasturba Gandhi Hospital
for Women and Children
Triplicane, Chennai,

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INSTITUTIONAL ETHICAL COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI -3

Telephone No: 04425305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
Dr. S. Sowmiya
PG in MD Obstetrics & Gynaecology
KGH/ Madras Medical College, Chennai -3.

Dear Dr. S. Sowmiya

The Institutional Ethical Committee of Madras Medical College reviewed and discussed your application for approval of the project / proposal / clinical trail entitled " Hyperlipidemia in preterm delivery. Assessment of lipid levels in pregnancy and outcome of preterm delivery" No 59082010.

The following members of Ethical committee were present in the meeting held on 24.08.2010 conducted at Madras Medical College,Chennai -3.

1. Prof. S.K. Rajan, MD	-- Chairperson
2. Prof. J. Mohanasundaram, MD,Ph.D,DNB Dean, Madras Medical College, Chennai -3	-- Deputy Chairman
3. Prof. A. Sundaram, MD Vice Principal , MMC, Chennai -3	-- Member Secretary
4. Prof R. Nandhini, MD Director, Institute of Pharmacology, MMC, Ch-3	-- Member
5. Prof. C. Rajendiran , MD Director, Institute of Internal Medicine, MMC, Ch-3	-- Member -- Member
6. Prof. Md. Ali, MD, DM Professor & Head ,,Dept. of MGE, MMC, Ch-3	-- Member -- Member
7 Prof. Shantha Ravishankar, MD Professor of Neuro Pathology, MMC, Ch-3	-- Member
8. Tmt. Arnold Soulina	-- Social Scientist

We approve the trail to be conducted in its presented form.

Sd /. Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study, any changes in the protocol and patient information / informed consent and asks to be provided a copy of the final report

Member Secretary, Ethics Committee

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INTRODUCTION

Obstetrics is a fine art built on the facts gathered by scientific research. In the era of modern obstetrics where there has been a rapid advancement in all specialties, preterm labor remains an enigma for the obstetricians today.

Preterm labor is defined as the onset of regular painful, frequent, uterine contractions causing progressive effacement and dilatation of cervix occurring before 37 completed weeks of gestation from the first day of last menstrual period. Any infant born before 37 completed weeks should be called as preterm (WHO 1969).

The lower limit which correlates with the fetal viability is less clearly defined. In United States it is 20 weeks. Royal college of obstetricians and Gynaecological (RCOG) working party considered it as 24 weeks. In India for legal purposes of viability it is defined as any gestation beyond 28 weeks (196 days).

Normal human pregnancy results in a pronounced physiologic hypertriglyceridemia involving a gestational rise in blood TGL & Cholesterol. During the first half of normal pregnancy, increased maternal fat accumulation (relative anabolic state) is presumed to be important for the subsequent hypertriglyceridemia normally occurring in later gestation (relative catabolic state). Circulatory concentrations of VLDL & LDL normally increase with gestational as reflected by marked increases in serum TGL and Cholesterol. The hypertriglyceridemia is primarily due to enhanced entry of triglyceride rich lipoproteins (esp VLDL) into the circulation rather than to diminished removal. Estrogen may play a major role in the lipoprotein patterns seen in human pregnancy although LDL cholesterol is more

influenced by the combined effect of increased estrogen and progesterone. Additionally placental lipoprotein lipase normally increases as term approaches.

It is known that plasma trigylcerides and cholesterol level, increase during pregnancy and that enhanced lipolytic activity play a key role in making free fatty acid available to the fetus. The influence of elevated maternal triglycerides and cholesterol has not been extensively studied. As elevated circulating levels of trigylcerides and cholesterol are a marker for increased risk of preterm labour in pregnant women. So We therefore evaluated the relationship of elevated triglycerides and cholesterol on risk of preterm delivery.

REVIEW OF LITERATURE

Cator Jim, Bodnar studied in early pregnancy lipid concentration and spontaneous preterm birth 2007 in that case control study of women with spontaneous preterm delivery cholesterol and triglycerides were elevated.

RECE MS, MCGREOR JA, ALLEN KG, HARRIS MA, case control study concluded that elevated fatty acid metabolism in a protion of women delivered preterm increased maternal red blood cells arachidonic acid is associated with an increased risk of preterm birth.

Chenx, Scholl study of association of elevated free fatty acids during late pregancy with preterm delivery. the concluding was elevated fasting plasma FFA were associated with an increased risk of preterm delivery.

INCIDENCE:

The incidence of pre-term labor in developed countries is between 5% to 10%. The incidence in India being 10-14% (FOGSI).

SERUM LIPIDS

Lipoproteins are spherical particles, assemblies of lipids and protein molecules. Their function is to transfer the lipids to and from the site of synthesis and catabolism. Major lipids and lipoproteins are cholesterol, triglycerides and phospholipids. Triglycerides and cholesterol esters are non-polar lipids that are insoluble in aqueous environments and comprise care of lipoproteins. Phospholipids and free cholesterol which are soluble in both lipids and aqueous environments cover the surface of the particles.

Lipoproteins are classified based on their density into 5 major classes.

They are: Chylomicrons, VLDL, IDL , LDL and HDL

Chylomicron - Largest of the particles, are of intestinal origin. They are responsible for transport of dietary triglycerides.

VLDL- Second largest particle, they are produced in liver. They transport endogenously produced triglycerides.

LDL- is responsible for intravascular metabolism of VLDL. They contain cholesterol ester and are the main circulating source of cholesterol. Strong relationship exists between increased LDL and cardiovascular disease.

HDL- These are small lipoproteins that originated in liver, small intestine , intravascular denovo synthesis. It plays a critical role in reverse transport of cholesterol from peripheral tissue to liver. It is the primary mechanism by which HDL protects against atherosclerosis.

Apoprotein provide structural stabilities to lipoprotein and determine metabolic fate of the particle upon which they reside.

Apolipoprotein	**Metabolic functions**
Apo A1	Structural component of HDL ; LCAT activator
Apo AII	Unknown
Apo AIV	Unknown: possibly facilitates transfer of other apo s between HDL and chylomicrons
Apo B48	Necessary for assembly and secretion of chylomicrons from the small intestine
Apo B100	Necessary for assembly and secretion of VLDL from the liver; structural protein of VLDL, IDL , LDL ,ligand for LDL receptor

(Adapted from Harrison's Text book of Medicine 18th edition)

Lipoprotein particles interact with specific receptor on peripheral cell membrane that recognize particles and aid in clearance from circulation. Brown &Goldstein described the diagnosis of one such receptor in 1976. Various steroids and peptide hormones regulate these receptor-LDL interactions.

Serum Lipids in Pregnancy

Pregnancy is associated with significant variation in blood rheology consequent mainly to changes in lipoprotein profiles. Although these changes were first described by Bacquerel and Rodier the exact elucidation of these changes is yet to be defined. An extensive review of literature revealed conflicting observation and implication of lipoprotein metabolism in normal and abnormal pregnancies.All plasma lipoprotein fractions undergo striking increase during pregnancy. All lipid levels significantly increase in second and third trimester.

- Total triglycerides increase 2-3 fold
- Total cholesterol rises 50-60% above non-pregnant levels.
- Apo-B increases by 56%
- Total cholesterol increases by 43%
- LDL increases by 36%
- Apo-A increases by 32%
- HDL increases By 25% in second trimester.

These changes are gradual and increase progressively throughout pregnancy after 25 weeks and peaks at term and return to pre pregnant level 6-8 weeks post partum.

Qualitatively some lipoproteins such as HDL, LDL becomes TGL enriched. VLDL however increases cholesterol and TGL 2-5 fold compared to non-pregnant levels. LDL, after an initial drop at 8 weeks, rises steadily up to term by 45-50% It is the only lipoprotein to remain elevated even after 8 weeks of delivery irrespective to lactation. Post partum measurements of lipids should be delayed for 6 months in women who did not have hypercholesterolemia prior to pregnancy.[1]

HDL is of particular interest. Unlike other lipoproteins, which rise through 36 weeks, this lipoprotein reaches its maximum level at mid gestation. It increases by 45% until 24 weeks and subsequently falls to 15% above non-pregnant level. These changes are confined to HDL_2 sub fraction. HDL_3 changes little.[2]

The physiological hyperlipidemia is of potential significance from several point of view[3] increase in plasma TGL may enhance available essential and non essential TGL and free fatty acids for placental transfer to fetus

a) LDL rise appears to be necessary for placental steroidogenesis and also for Transplacental cholesterol transfer to fetus.

b) TGL-increase may be a parameter of a general metabolic adaptation by mother to augment nutrient flow to fetus.

The hyperlipidemia may stress maternal lipid homeostasis to an extent that sub clinical hyperlipidemia may be detectable analogous to the prediabetic recognition in women when she develops gestational diabetes.[4]

In a review article Herrara stressed that during early pregnancy there is increased body fat accumulation associated with both hyperplasia and lipogenesis During late pregnancy there is an accelerated breakdown to fat depots, which play an important role in fetal development.[5]

LIPIDS	**NON-PREGNANT ADULT**	**FIRST TRIMESTER**	**SECOND TRIMESTER**	**THIRD TRIMESTER**
TOTAL CHOLESTEROL(mg/dl)	< 200	141 - 210	176 - 299	219 - 349
TRIGLYCERIDES(mg/dl)	< 150	40 – 159	73 - 382	131 - 453

WILLIAM OBSTETRICS 23 rd edition

Etiology:

Only when the factors causing prematurity are clearly understood any attempt at prevention can be made.

Nearly 50-60% preterm births occur following spontaneous labor. 30% is due to premature rupture of membranes and rest are iatrogenic.

One of the major reasons for increase in incidence of preterm birth is increase in multiple pregnancies (fertility drugs and artificial reproductive technology) and increased surveillance and intervention in high risk, pregnancies (Ian Donald 6th edition.)

Hyperlipidemia:

Catov et al reported that an elevation in maternal triglycerides or cholesterol level in early gestation was associated with a greater than 2 fold increased risk of preterm delivery.

Uterine Causes:

- Congenital abnormalities 1-3% particularly septate and bicornuate uterus.
- Incompetent cervix and cervical anatomical abnormalities.
- Overdistension of uterus.

Genetic:

- Genes for decidual relaxin.
- Fetal mitochondrial trifunctional protein defect.
- IL-1, B2 adrenergic receptor gene.
- Tumour necrosis factor - alpha are implicated.

Fetal:

- Congenital abnormalities.

Placental:

- Abnormal placentation (causing decreased uteroplacental blood flow).
- Anatomical abnormalities, Placenta Praeyia
- Abruptio placenta.

Infections:

a. **Uterine Infections.**

- Group B streptococcus (Boloitt et al lamontet al)
- Chlamydia trichomatis (Martin et al Harrison)
- Mycoplasma hominis & ureaplasma urealyticum (Klein et al, 2005)
- Asymptomatic bacterial vaginosis and trichomonas vaginalis confers a modest risk of spontaneous preterm labor (Gravett et al)

b. **Extrauterine Infections:**

- High prematurity rate is associated with asymptomatic bacteruria & UTI (Robertson et al).
- Other are systemic illness like pneumonia, pyelonephritis, periodontal disease is associated with preterm labor. (Xiong X 2006)

Vaginal Bleeding:

- Vaginal bleeding in early pregnancy is associated with preterm labor (Williams obstetrics 23rd edition.)
- Preterm labor of unknown origin 20-30%

Pathophysiology:

The control of parturition is achieved by complex integration of endocrine, paracrine and autocrine mechanism.

The fetal pituitary adrenal axis needs to be intact (Gonitk B et al) stress induced release of corticotrophin releasing hormone initiates parturition.

When fetal adrenal axis becomes more sensitive to ACTH there is increase in cortisol production, which leads to increased 17- alpha hydroxylase and finally decreased progesterone.

Differential production of PGE2 and PGF 2alpha by the three enzymes – phopholipases, PGH2 synthase, 15 hydroxy prostaglandin dehydrogenase may be the key in the balance between uterine quiescence and activity. This decidual activation and production of uterotropins is the penultimate event in initiation of labor.

Lipid changes in preterm delivery:

Maternal hyperlipidemia is one of the most consistent and stricking changes to take place in lipid metabolism during pregnancy. The mechanisms responsible for these changes include increased lipolytic and decreased LPL activities in adipose tissue. (Herrera and colleagues, 2006). the hepatic effects of estradiol and progesterone also play an important role (Desoye and associates 1987).

We have several hypothesis for why high FFA may increase risk of spontaneous preterm delivery.

1. Maternal circulating FFAS can be transferred to the fetus across the placenta.

   In support of this hypothesis was the observation that maternal plasma total

FFAS were positively correlated with cord plasma FFAS. These include the essential FFAS and their metabolically important derivatives such as arachidonic acid a precursor of the eicosanoids including prostacyclins and prostaglandins.

2. It is known that prostaglandin play an important role by stimulating the uterine contractions that drive preterm delivery, Reece et al reported a higher proportion of maternal RBC and plasma arachidonic acid in preterm cases compared with controls Thus the could be indirect evidence for excessive maternal arachidonic availability or mobilization in preterm labor.

High FFAS may link to proinflammatory pathways. Preterm labor is recognized as an inflammatory phenomenon, even in the absence of infection, specific unsaturated fatty acids, particularly the essential fatty acid linoleic acid, which comes from the maternal diet.

Selectively stimulate the development of a proinflammatory response in human endothelial cells studied in Vitro, increases in inflammatory cytokine formation in human decidua stimulate prostaglandins synthesis. Thus high maternal circulating FFA could be linked to inflammation a known risk factor for preterm delivery.

Epidemiology

1. **Race**

   The incidence is greater among black women(Varner et al 2005)

2. **Age**

It is more common in extremes of age. Lumley JM et al 1993, reported high incidence of preterm delivery in women under 17 Years and over 35 years.

3. **Weight**

Poor nutrition, prepregnancy weight and weight gain during pregnancy play a important role in causing preterm birth. Hickly and colleague 1995, have shown low maternal prenatal gain is specifically associated with preterm birth

4. **Stature**

Short statured mother have more tendency to produce smaller babies.

5. **Socio-Economic Status**

Women from lower socio economic status tends to be less educated and would not have satisfactory general, perinatal and antenatal care (Goffinet F 2005) are at increased risk of preterm labour.

6. **Addictions**

Woman who smoke cigarettes or who abuse cocaine are at increased risk of preterm labor (Berns 2002)

7. **Occupational Factors**

Those involved in manual work are more prone for preterm labor.

PREDISPOSING FACTORS

1. **Stress**

Careers which involve considerable physical work and psychological stress are associated with increased preterm births (Papiernik & Kaninski 1974). Prolonged

standing decreases uteroplacental blood flow and increases the frequency of large placental infarcts causing growth retardation.Preterm birth is increased in women living alone, and those who are subjected to physical abuse.

2. Coitus

Coitus was not found to be associated but increasing numbers of sexual partners increased the risk of recurrent preterm delivery (yost NP et al 2006).

3. Reproductive History

a. Previous Preterm Birth

The history of one previous preterm birth is associated with a recurrence risk if 16-41% (Williams 23rd edition), risk increasing with the number of preterm birth decreasing with the number of term deliveries.

b. Previous abortion

There is increase in the preterm deliveries in woman who Experienced one or more second trimester abortions.

c. Cervical incompetence

d. Uterine anomalies

e. Pregnancy complications

- Multiple pregnancies(Goldenberg RL, 2002)
- Hydramnios
- Preclampsia
- Antepartum hemorrhage

- Second trimester bleeding not due to placental causes

4. Interpregnancy interval

A significant increase in preterm birth was observed when the interval between birth and LMP if next pregnancy was less than 3 month.

5. Fetal Gender

The main fetal factor influencing the rate of preterm delivery is fetal sex, with preponderance if males delivering preterm.

PREDICTION OF PRETERM LABOUR

Cervical assessment

Asymptomatic cervical dilatation after mid pregnancy has gained attention as a risk factor for preterm delivery.

Owen and Colleagues (2003) concluded that the value of cervical length to predict preterm birth before 35 weeks is apparent only in women at high risk for preterm birth.

Ultrasound is a better modality than digital evaluation of cervical length because the upper half of cervix which cannot be reached digitally can be measured by ultra sonogram.

Transvaginal ultrasound is better than Transabdominal because if close proximity of cervix to probe and less distortion by transducer pressure or full bladder.

Fetal breathing movements: Absences of fetal breathing movement on ultrasound performer at the time of admission on women who presented with threatened preterm labor was also found to be accurate test in predicting spontaneous preterm birth.

Uterine Activity Monitoring

Current opinion is that for most patients home uterine monitoring is not better than frequent nursing contact and support. Katz and Associates found that women who has subsequent preterm delivery had increased uterine contractions at 30 weeks

Only patient, who cannot recognize adequately the presence of contractions like multifetal gestation and other over distended uterus may benefit from home uterine monitoring.

Fibronectins

The presence of fetal fibronectin in cervicovaginal secretions in late second and early third trimester has been proposed as a specific predictor of preterm labor (Lock wood and coworkers 1991). It represents disruption of choriodecidul interface which can be caused by preterm labor. It can be measured using ELISA and values exceeding 50ng/ml are considered positive result. However of concern is the high false positive rate if there is contamination with amniotic fluid, semen, maternal blood and in patients with cerclage. The test in more accurate in predicting spontaneous preterm birth within 7-10 days in women with symptoms of threatened preterm labor before advanced cervical dilatation.

The high negative predictive value of fetal fibronectin can be used to influence management (Honest h et al 2002).

In symptomatic women the group found that cervicovaginal fetal fibronectin and absence of fetal breathing moments of ultrasonogram are likely to be accurate in predicting preterm birth.

Biochemical Markers

1. Salivary oestriol : progesterone ratio
2. Salivary oestriol >1.8/ml before 34 weeks has a sensitivity of 68% and specificity of 76% for preterm labor before 35 weeks of gestation(Darne et all)
3. Serum collagenase
4. Tissue inhibitor if metalloproteinase (TIMP) /Matrix
5. Relaxin
6. Corticotrophin Releasing Hormone (CRH)
7. Human chorionic gonadotropin
8. Mediators of inflammation and infection

    a. C-Reactive protein

    b. Granulocyte elastase

    c. Cytokines (Il-6, TNF)

    d. Amniotic fluid glucose concentration

    e. Zinc and Lipocortin -1 (Romeo R et al)

    g. Positive cultures

    h. Granulocyte colony stimulating factor

These are not practically helpful in prediction of preterm labor

DIAGNOSIS OF PRETERM LABOR

Symptoms of preterm labour

- Menstrual like cramps
- Low, dull back ache
- Pressure (Feels like baby is pushing down)
- abdominal cramping
- Increase or change in vaginal discharge
- Uterine contractions that are 10 minutes apart of closer

2. Pelvic examination

3. Ultrasonogram

Ultrasonographic assessment in preterm labor

- Fetal viability
- Gestational age
- Estimated fetal weight
- Indicators of preterm labor
- Transvaginal cervical assessment
- Fetal breathing movements
- Amniotic fluid volume
- Number of fetus

- Fetal presentation and lie
- Fetal movements and tone
- Fetal anomaly
- Placental localisation and morphology
- Uterine fibroid and adnexal mass

4. Tococardiography

The amplitude, duration, shapes of contraction frequency and basal tone and monitored. The uterine activity is monitored. Changes in FHR (Fetal Heart Rate) pattern occurring in preterm labor is normally due to immaturity of cardiovascular system. Repetitive late decelerations, absent variability and variable decelerations are sign of placental insufficiency.

RISK OF PRETERM INFANT:

- Birth asphyxia
- Respiratory Distress syndrome
- Apneoa of prematurity
- Jaundice
- Haemorrhage
- Metabolic problem
- Retrolental fibroplasia
- Sensorineural deafness

- Developmental Delay
- Reduced growth potential
- Recurrent Respiratory infections
- Cerebral palsy
- Necrotizing enterocolitis
- Patent Ductus arteriosus
- Broncho pulmonary dysplasia
- Feeding difficulties
- Learning difficulties
- Sudden Infant death syndrome
- Intraventricular/Intra cerebral hemorrhage.

The cost of preterm birth can be measured in terms of mortality and morbidity and in short term and long term financial costs which increase with lower gestational age. The components at the costs are nursery, medical staff, stay in neonatal intensive care unit and treatment. Such as ventilation, artificial surfactant, recombinant erythropoietin and surgical procedures. The long term financial implications are unknown if the child is handicapped either physical or mental.

PREVENTION OF PRETERM LABOR

I Basic care:

1) Support system of family should be developed.
2) Numerous suggestions on coping with physical and mental stresses of maintaining a pregnancy should be descried.
3) Education, supportive services from health care provider and financial issues are of common concern.
4) Behavioural and lifestyle modification
    a. Smoking cessation (Burguet et al)
    b. Adequate nutrition

II Bed rest and Hydration

Although bedrest and hydration are widely used as the first step of prevention and treatment, there is no evidence that this practice is beneficial (Freda MC et al, Goldenberg RL et al.,)

Bed rest should be advised with caution after evaluating its benefits and risks in an individual, and not routinely keeping in mind its adverse effects like venous thrombosis and pulmonary edema.

Aggressive Treatment of Cervicovaginal Infection

Bacterial vaginosis has been consistently associated with a 1.5 to 3 times increased risk of spontaneous preterm birth. But the efficacy of treatment in reduction of preterm births is conflicting (Goldenberg R, et al) 1998). But recent systematic

review by Varma R, Gupta JK 2006 concluded that screening and treatment of asymptomatic bacteruria and bacterial vaginosis in low risk population groups may reduce the rate of preterm deliveries.

Most Randomised control trials show that intravaginal clindamycin cream used to treat bacterial vaginosis does not prevent preterm birth. (Kekkki et al, 2001)

Cervical Encerclage

A short cervix diagnosed by ultrasound in asymptomatic women may be an indication for cerelage. The role of cervical for the prevention of preterm delivery is now disputed. A number of systematic reviews which demonstrate a trend towards reduction in preterm delivers before 34 weeks in high risk women who had cerelage compared to those managed expectantly (Honest H, et al).

Two randomized trials Lazar et al., and Rush et al., did not show benefit for routine cerclage in women at moderate risk of preterm delivery. Also cerclage has an inherent risk which actually increase preterm labor by increasing the pericervial inflammation or infection. Hence unless the diagnosis is specific it is not recommended. But a MRC/RCOG trial in low risk women demonstrated that cerclage was associated with low risk of delivery below 33wks.

Progesterone

Weekly intramuscular administration to women at high risk for preterm labor resulted in lower rates of preterm birth and perinatal mortality when compared with that placebo, Meis and collaboraters (2003). The dose used by Meis et al was 250mg

of 17 hydroxy progesterone caproate, intramuscularly every week from 20 to 36 weeks.

A Cochrane Systematic Review in 2006 by Dodd JM et al found that the use of progesterone on women with history of spontaneous preterm birth resulted in a reduction in risk of preterm birth before 34 weeks of gestation and Infant birth weight than 2500 grams. But the dose, route of administration and time commencement of therapy has not been arrived conclusively by this study for need of further information. For women with threatened preterm labor the role of progesterone is uncertain as per this review.

MANAGEMENT OF PRETERM LABOR

Bedrest and Hydration

Steroids

In 1995, a National Institute of Health Consensus development panel recommended corticosteroids for fetal lung maturation in preterm labor. Since then there has been nearly universal acceptance and implementation of these recommendations.

All pregnant women between 24 and 34 weeks of gestation who are at risk of preterm delivery within 7 days should be considered candidates for antenatal corticosteroids.

Recommended regimens includes a single course of two doses of 12mg of betamethasone given intramuscularly 24 hours apart, or four doses of 6mg of dexamethasone given intramuscularly 12 hours apart.

Although benefit on neonatal outcome is maximum between 24 hours and 7days after initiation of therapy, steroids confer significant survival advantages even when delivery occurs within 24 hours Therefore treatment should not be withheld when delivery is probable within 24 hours.

Tocolysis

Tocolysis is pharmacological suppression of uterine activity

Indication:

Preterm delivery is a major cause of perinatal morbidity and mortality. Tocolytic agents are effective in reducing the likelihood of delivery wthin 48 hours but do not reduce the overall risk of preterm delivery.

Consideration should be given for administration of tocolytics to all women experiencing preterm labor when there is a delay in delivery

- to permit in - utero transfer to a tertiary perinatal centre for multi Disciplinary management (obstetrician, neonatologist, anaesthetists).
- to gain upto 48 hours to allow for the administration of corticosteroid to enhance pulmonary maturity .

BETA SYMPATHOMIMETICS

Caritis et al 1976, noted that small doses of epinephrine inhibited uterine hyperactivity . Efforts to produce an epinephrine like compound which lacked the cardiovascular stimulant effect culminated in the synthesis if β agonists.

I generation:- Isoxsuprine, Orciperenaline, isoprenaline

II generation:- Ritodrine, Terbutaline, fenoterol.

The most commonly used β2 agonist for tocolysis is ritodrine., then are terbutaline and salbutamol.

Ritodrine:

Ritodrine infusion is started at a dose of 50μg/min and increased very 20 minutes until uterus is quiescent or side effects limit escalation of dose. Side effects are palpitations, tremor, nausea, headache, chest pain, dyspnoea, pulmonary edema, hypokalemia, myocardial ischemia, arrhythmias.

Terbutaline:

Not used as much as ritodrine, but is effective in temporarily suppressing contraction when given parenterally.

Intravenous dose is 5-10μg/min, increased every 10-15 min to a maximum of 80μg .2.5-5mg is given orally every 4-6 hours & 250 μg subcutaneously every 20-30 min given as 4-6 doses. Terbutaline has higher a risk of hyperglycemia than ritodrine. Other side effects are similar. But β2 agonists are no longer the first choice of drugs for tocolysis because of their side effects(RCOG Clinical Guide Lines, 2002 and Anotayanonth et al., 2004)

Contraindications of β2 agonist:-

- Symptomatic cardiac disease especially ventricular outflow obstruction
- conduction disturbance

- Hyperthyroidism
- Sickle cell disease
- Uncontrolled maternal diabetes mellitus
- Chorioamnionitis
- Eclampsia or severe preeclampsia
- Multifetal gestation
- Severe obstetrical bleeding

MAGNESIUM SULPHATE

$MgSO_4$ uncouples the depolarisation contraction coupling. During the depolarisation of myometrial cells, Mg^{++} competes with ca_+ to for entry into the cell causing less intracellular ca+ to participate in actin -myosin interaction during smooth muscle contraction. It affects neural transmission by modifying acetyl choline release and sensitivity at motor end plate .

Contractility is inhibited at serum level of 5-8 mEq/dl. Deep tendon reflexes are lost at 9-13mEq/dl. Respiratory depression occurs at >14mEq/dl.

Dosage: Intravenous loading dose of 4g administered over 20 minutes followed by maintenance dose of 1 -2g/hr.

Side effects include flushing, dizziness, nausea, lethargy, chest tightness, Hypocalcaemia, Pulmonary edema, respiratory depression and depressed motor, respiratory activity in fetus. It is contraindicated in myasthenia gravis, heart block, renal disease, recent myocardial infarction.

Magnesium sulphate is an ineffective tocolytic agent as shown by a Cochrane systematic review (Crowther et al, 2002., Cox etal 1990)

PROSTAGLANDIN SYNTHETASE INHIBITORS

Drugs like aspirin, indomethacin, naproxen fenamate and silenced inhibit the prostaglandin synthesis, decrease the myometrial gap junctions and decrease the influx of calcium

Maternal side effects includes nausea, vomiting, drug rash headache, gastritis,diarrhoea. In fetus it produces constriction of ductus arteriosus,pulmonary hypertension and oligohydramnios. Intraventricular hemorrhage, necrotising entercolitis have also been reported.

They are effective as single dose in inhibiting the myometrial activity in many women at term (Reiss et al, 1997). Tow randomised trials which compared the effect of indomethacin and placebo in delaying delivery showed significant delay at 48 hours and at 7-10 days.

Comparison with agonists show similar efficacy ,but a better side effect profile (RCOG GUIDELINE 2002). However, their use is limited because of their effects in the fetus.

CALCIUM CHANNEL BLOCKERS

They are heterogeneous group of organic compounds that inhibit the influx of extracellular calcium across the cell membrane during inward calcium current of action potential. They block the voltage sensitive L Type of calcium channels. They also inhibit the release of intracellular calcium from the sarcoplasmic reticulum. Thus

they reduce the tone of smooth muscles. The commonly used drug Nifedipine is a potent inhibitor of myometrial contractions in non pregnant, pregnant and post partum uterus (Anderson et al, 1979)

Treatment Regime

The optimal dosing regimen of Nifedipine has not yet defined. Read and Wellby 1986, George et al 1991, showed that an initial dose of 30mg followed by 20mg 8^{th} hourly for 3 days, reported a 75% successful tocolysis in 71% and 76% respectively. The tocolytic regimen given in Obstetrics and Gynaecology Clinics of North America(Andrienne Z et al) is loading dose 30 mg orally and maintenance dose of 10-20 mg orally every 4-6 hrs.

In Clinical Obstetrics and Gynaecology 2000, Amy E et al found the following dosing regimens in various study protocols. Most administered a initial loading dose of 30mg of oral nifedipine followed by 10mg to 20mg dose every 4 to 6 hrs. Sublingual nifedipine loading doses are no longer advised.

OXYTOCIN ANTAGONISTS (ATOSIBAN)

There will be increase in myometrial oxytocin receptors in labor. The analogue competitively blocks the oxytocin receptors and inhibits preterm labor.

Atosiban is given intravenously 6.75 mg bolus over one minute followed by infusion at 18mg /hr for 3hours and then 6mg/hr for upto 45 hours. Duration of treatment should not exceed 48 hrs and the dose should not exceed 330 mg of atosiban. Side effects are nausea, chest pain, vomiting and dyspnoea. Compared to β agonist atosiban has similar efficacy but a better side effect profile.

Royal College of Obstetricians and Gynaecologists guidelines 2002, suggest that if tocolytics are administered, the first choice should be oxytocin antagonists or Nifedipine. But compared with other tocolytics atosiban therapy is costly.

NITRIC OXIDE DONORS (GLYCERYL TRINITRATE)

Nitiric oxide is a potent endogenous hormone causing smooth muscle relaxation. The No donors inhibit corticotrophin releasing hormone secretion which acts as a promoter of parturition. 10mg of Glyceryl Trinitrate patch is applied over the fundal region of maternal abdomen. If tocolysis is not achieved in one hour, another 10mg patch can be applied to a maximum dose of 20mg in24 hors. Cochrane review (2000) by Duckitt K et al showed that nitroglycerine did not delay delivery or improve neonatal outcome when compare with placebo, no treatment or alternative tocolytics.

K+ CHANNEL OPENERS:

Diazoxide is a medication structurally related to thiazide diuretics that is used in treatment of hypertensive crisis It inhibits contractility of smooth muscles there by rendering myometrial quiescence

Dosage is 5mg /kg, given intravenously slowly in 15-30 minutes. The drug is diluted in half normal saline. It can also be given in boluses of 50-100 mg every 5 minutes. Side effects are hypotension, tachycardia, hyperglycemia, and decreased uteroplacental blood flow secondary to maternal hypotension. The fetal side effects

are hypoglycemia and fetal distress secondary to maternal hypotension. Further evaluation of this newer group of tocolytic drugs is needed.

AIM OF THE STUDY

To Evaluate the association of elevated Serum Triglycerides and Cholesterol levels at 24, 28, 32 weeks gestation in uncomplicated pregnancy and preterm delivery. To associate the elevated levels of Serum Triglyceride and Cholesterol as a predictor of preterm delivery.

MATERIALS AND METHODS

The study group includes 444 healthy pregnant women, fasting triglycerides and cholesterol levels during 24, 28, 32 weeks Gestation who have come to antenatal checkup at the **Institute of Obstetrics Kasturba Gandhi Hospital for Women and Children, Triplicane, Chennai-5** during the period September 2010 to October 2011.

Only those patients we could follow up to term and planning delivery at KGH were included in the study. The design of the study prospective study. The biochemical investigations were done at the Institute of Biochemistry, Madras Medical College. The hospital ethical committee approved the study.

Out of 444 antenatal mothers selected on the basis of inclusion and exclusion criteria 44 were excluded during the study for various reasons. 18 developed PIH, 4 developed Gestational diabetes Mellitus, and 22 were lost to follow up.

INCLUSION CRITERIA:

Age = 17 – 35 yrs.

Gestational age = From participants last menstrual period confirmed or modified by USG.

EXCLUSION CRITERIA:

- GDM
- Pregnancy included Hypertension
- Previous H/O preterm delivery

- Multiple pregnancy
- Hydramnios
- Cervical Incompetence
- Preexisting medical disease
- Cardiovascular disorder
- Renal disorder
- Congenital anamolies of fetus/malformation
- Maternal Alcohol consumption <20g/day
- Smoking
- Unknown last menstural period.

METHODS:

In all these antenatal mothers detailed history with special reference to diet and habits, followed by complete general and obstetric examination were done. The purpose of interrogation and investigation was explained to every patient and her informed consent obtained.

GENERAL EXAMINATION:

Height, weight, pulse, blood pressure, edema, anemia, cardiovascular, respiratory and central nervous system disorder were examined.

OBSTETRIC EXAMINATION: Per Abdomen Examination

PROCEDURE:

From all the antenatal mothers who were included in the study, blood sample was taken after overnight fasting.

Under strict aseptic precaution blood was obtained for Serum triglycerides and other investigations by venepuncture.

Serum triglycerides and cholesterol between 24, 28 ,32 weeks gestation were obtained after overnight fast. The patients were followed till delivery.

LABORATORY TESTS:

The blood samples for serum triglycerides and cholesterol were collected and analyzed.

TOTAL CHOLESTEROL:

Serum total cholesterol were determined by automated enzymatic method using Burstein, Lopes-Vivella CHOD-PAP method. Chylomicrons are precipitated by adding phosphotungstic acid solution and magnesium ion to the sample. Centrifugation leaves HDL in supernatant fluid. The cholesterol content is determined enzymatically.

PROCEDURE:

200 ml of sample with 500 ml of precipitant fluid were mined together and a precipitate is obtained by allowing it to stand for 10 minutes at room temperature. This is then centrifuged and 100 ml of the supernatant fluid is mixed with 1000 ml of reagent solution. Phosphotungstic acid. The results are obtained by analyzing the absorbance of sample and standard using semi auto analyzer.

TRIGLYCERIDES:

It is estimated by Enzymatic colorimetric test GPO-PAP method using reagent supplied y centronic Gm6H-Germany.

PRINCIPLE:

The formation of colored phenazone compound n treating triglycerides with the reagent forms the basis of the test.

Sample of 10 ml and 1000 ml of reagent are mixed and incubated for 5 minutes at 37 C and absorbance of sample measured within 60 minutes.

Results were analyzed in semi auto analyzer. (ERBAKEMP).

RESULTS AND ANALYSIS

Statistical Tools :

The information collected regarding all the selected cases were recorded in a Master Chart. Data analysis was done with the help of computer using Epidemiological Information Package (EPI 2010) developed by Centre for Disease Control, Atlanta.

Using this software range, frequencies, percentages, means, standard deviations, chi square and 'p' values were calculated. Kruskul Wallis chi-square test was used to test the significance of difference between quantitative variables and Yate's chi square test for qualitative variables. A 'p' value less than 0.05 is taken to denote significant relationship.

RESULTS

A: PROFILE OF CASES STUDIED

Table 1: Age Distribution

Age group	Cases	
	No	%
Less than 20 years	31	7.8
20 – 24 years	321	80.3
25 – 29 years	48	12.0
Total	400	100
Range	19 – 27 years	
Mean	22.04 years	
SD	1.94 years	

Majority of the women included in this study were 20 – 24 years old. The study group had a mean age of 22.04 years and a standard deviation of 1.94 years.

AGE DISTRIBUTION

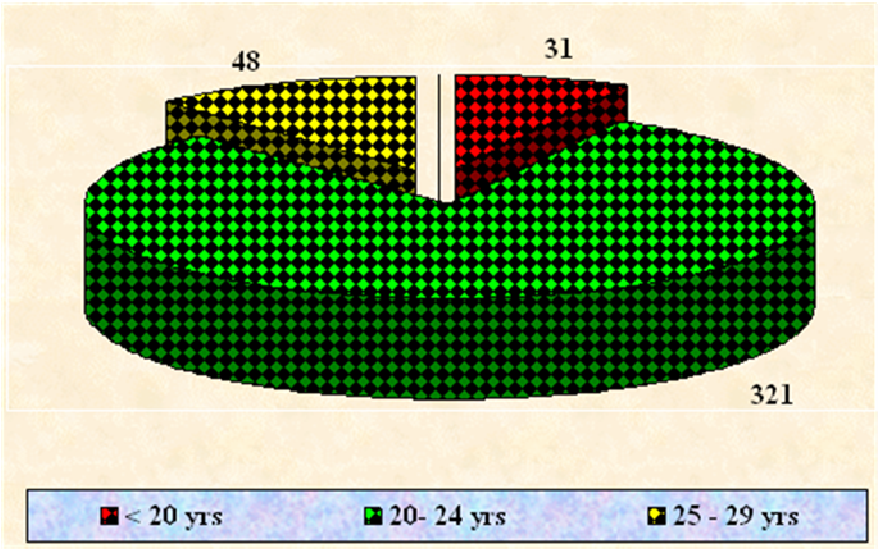


Table 2: Obstetric Code

Obstetric code	Cases	
	No	**%**
Primi	190	47.5
Second gravida	210	52.5
Total	400	100

47.5% of the mothers included in the study were primis. Rest of the mothers (52.5%) were second gravida mothers.

OBSTETRIC CODE

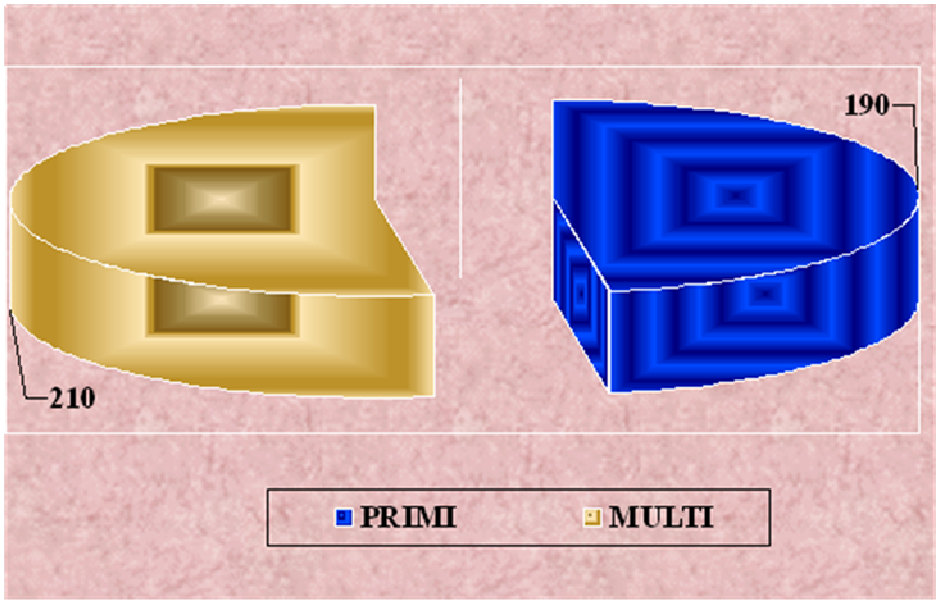


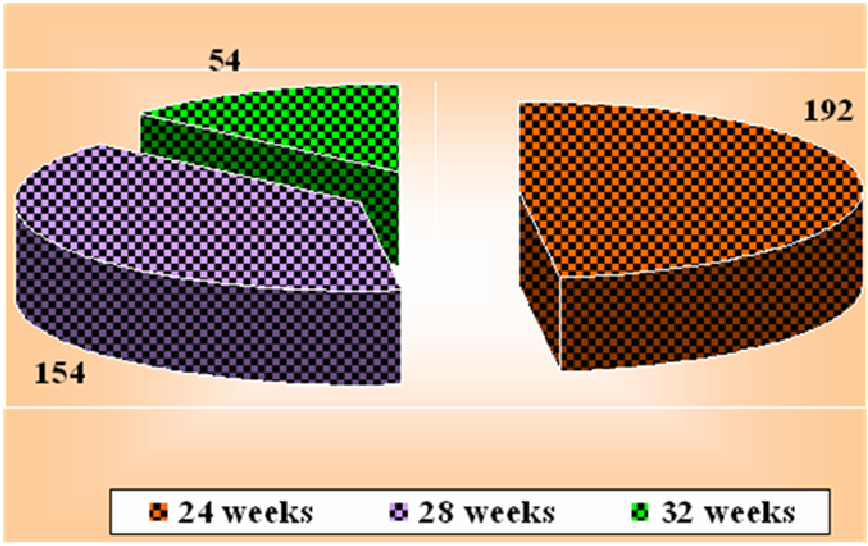
Table 3

Gestational age at which blood was collected for lipid analysis

Trimester at the time of blood collection	Cases	
	No	%
2nd trimester	346	86.5
3rd trimester	54	13.5
Total	400	100
G.A	No	%
24 weeks	192	48
28 weeks	154	38.5
32 weeks	54	13.5
Total	400	100

Lipid levels were assessed for 346 mothers in the second trimester and for 54 mothers in the third trimester.

GESTATIONAL AGE



B : LIPID PROFILE

Table 4 : Total Cholesterol

Trimester	Total cholesterol (mg/dl)			
	Normal		Abnormal	
	No	%	No	%
2nd trimester (346)	330	95.4	16	4.6
3rd trimester (54)	53	98.1	1	1.9
Total (400)	383	95.8	17	4.3
Range	145 – 397			
Mean	247.3			
SD	41.3			

16 mothers (4.6%) had abnormal cholesterol levels in the second trimester and one mother (1.9%) in the third trimester. The study group had a serum cholesterol level of 247.3 $\pm$41.3 mg/dl.

TOTAL CHOLESTEROL

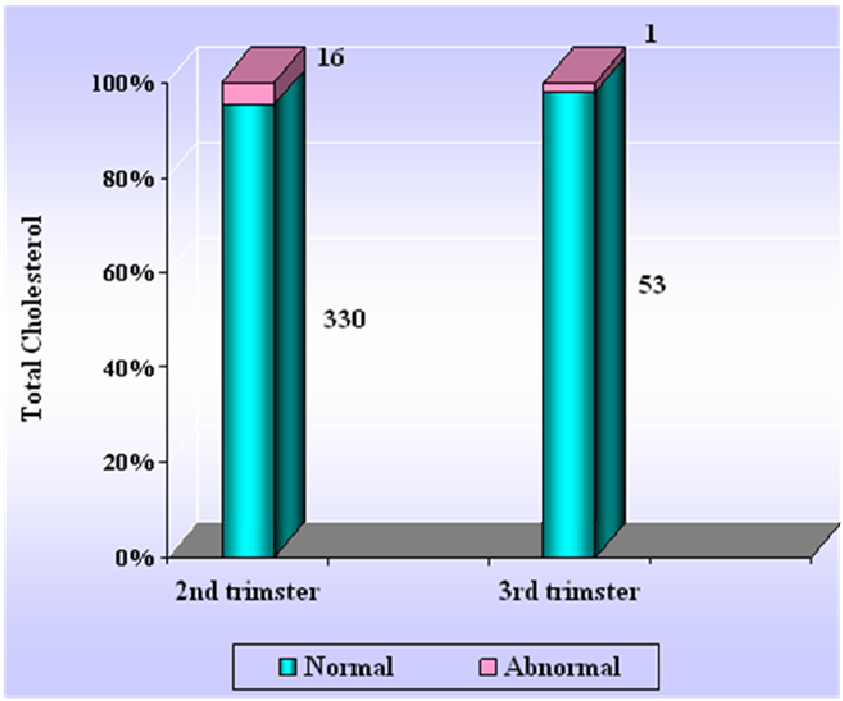
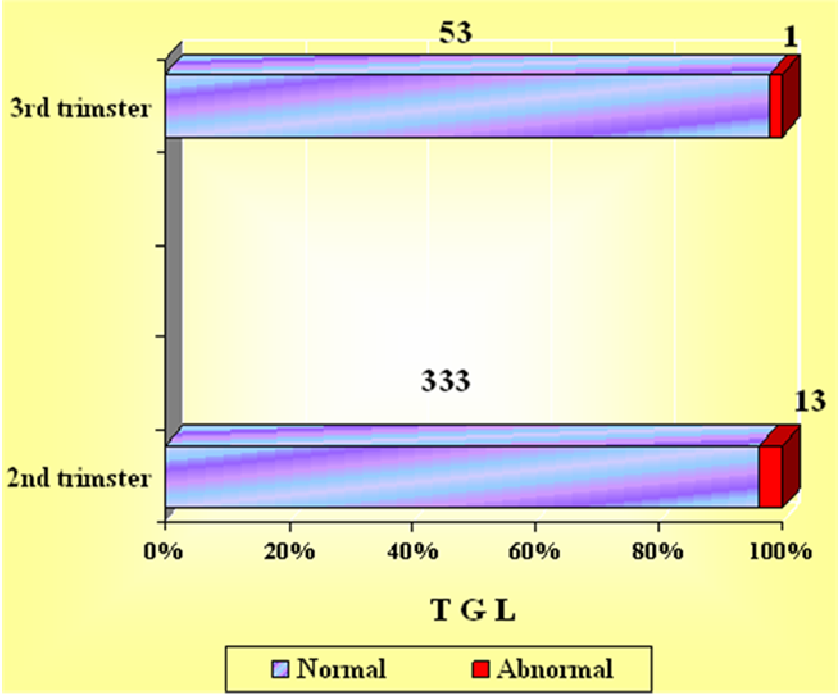


Table 5 : Serum Triglycerides

Trimester	Sr. TGL (mg/dl)			
	Normal		Abnormal	
	No	%	No	%
2nd trimester (346)	333	96.2	13	3.8
3rd trimester (54)	53	98.1	1	1.9
Total (400)	386	96.5	14	3.5
Range	86-472 mg/dl			
Mean	278.9			
SD	79.6			

3.8% of mothers in the second trimester and 1.9% of mothers in the third trimester had abnormal triglyceride values. The mothers had an average TGL of 278.9 mg/dl.

T G L


53
1
3rd trimster
333
13
2nd trimster
0%
20%
40%
60%
80%
100%
T G L
Normal
Abnormal

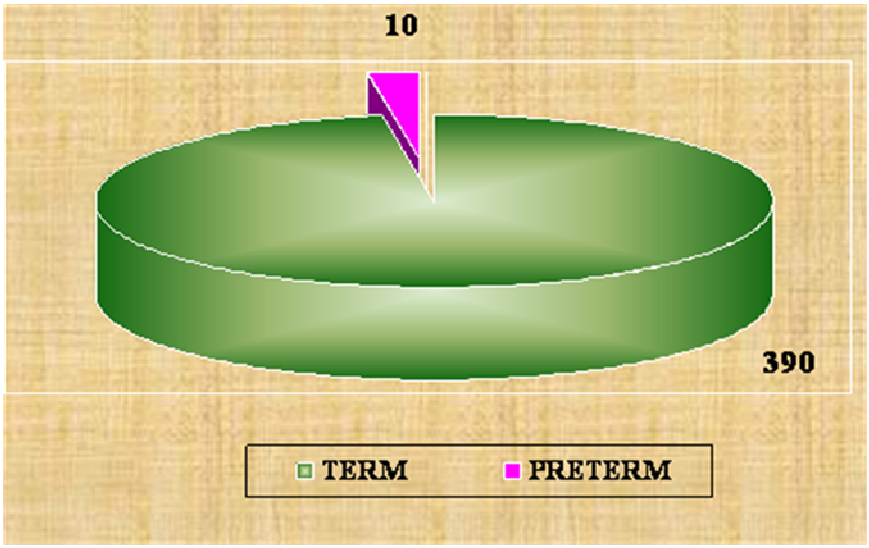
C : OUTCOME OF DELIVERY

Table 6 : Outcome

Outcome	Cases	
	No	%
Good	390	97.5
Preterm	10	2.5
Total	400	100

Out of the 400 mothers included in the study, only 10 (2.5%) had preterm delivery.

OUTCOME



D : RELATIONSHIP BETWEEN LIPID LEVELS AND OTHER VARIABLES WITH OUTCOME OF DELIVERY

Table 7 : Age of mother and outcome of delivery

Outcome of delivery	Age of mother (in years)	
	Mean	SD
Good	22.06	1.95
Preterm	21.02	1.55
'p'	0.1389 Not significant	

There was no statistically significant difference in the mean age of mothers with good outcome and mothers who had preterm delivery ($p > 0.05$).

AGE & OUTCOME

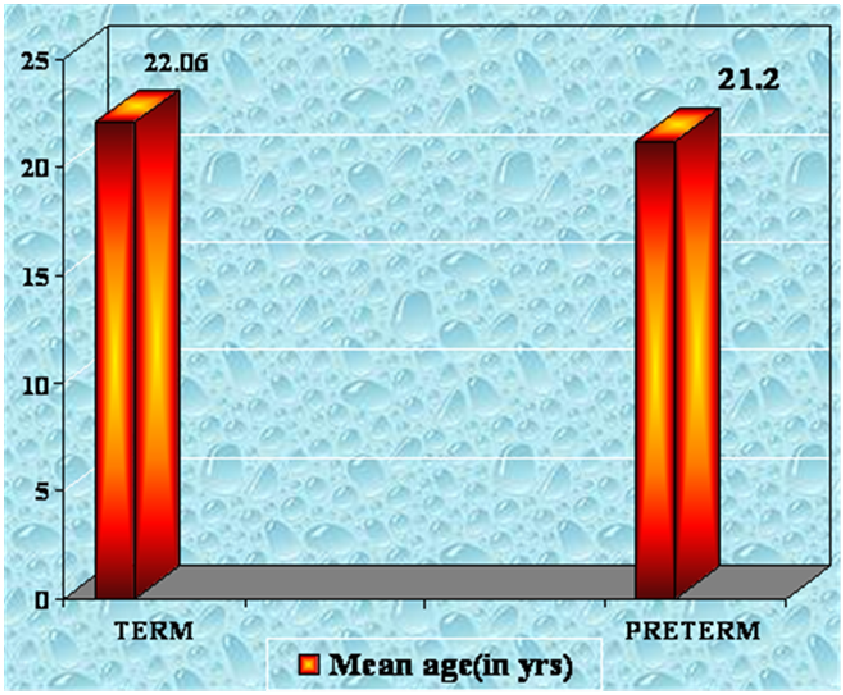


Table 8 : Obstetric code and outcome of delivery

Obst. Code	No. of cases	Outcome of delivery			
		Good		Preterm	
		No	%	No	%
Primi	190	185	97.4	5	2.6
Second gravida	210	205	97.6	5	2.4
'p'	0.5611 Not significant				

The percentage of preterm deliveries among primis and second gravidas did not have statistically significant difference (p = 0.5611)..

OBSTETRIC CODE & OUTCOME

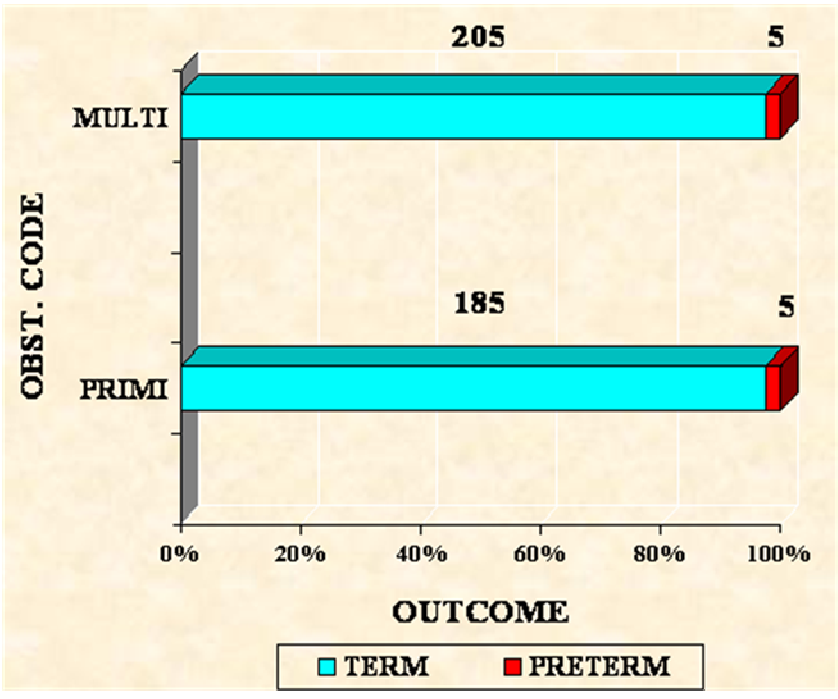


Table 9 : Serum cholesterol and outcome of delivery

Sr. cholesterol	No. of cases	Outcome of delivery			
		Good		Preterm	
		No	%	No	%
Normal	383	383	100	-	-
Abnormal	17	7	41.2	10	58.8
Sr. cholesterol Mean SD		245.2 39.5		329.3 25.3	
'p'		0.0001 Significant			

All the mothers with normal cholesterol values had good outcome whereas 58.8% of mothers with abnormal cholesterol values had preterm deliveries. This difference in statistically significant (p = 0.0001).

SERUM CHOLESTEROL &

FETAL OUTCOME

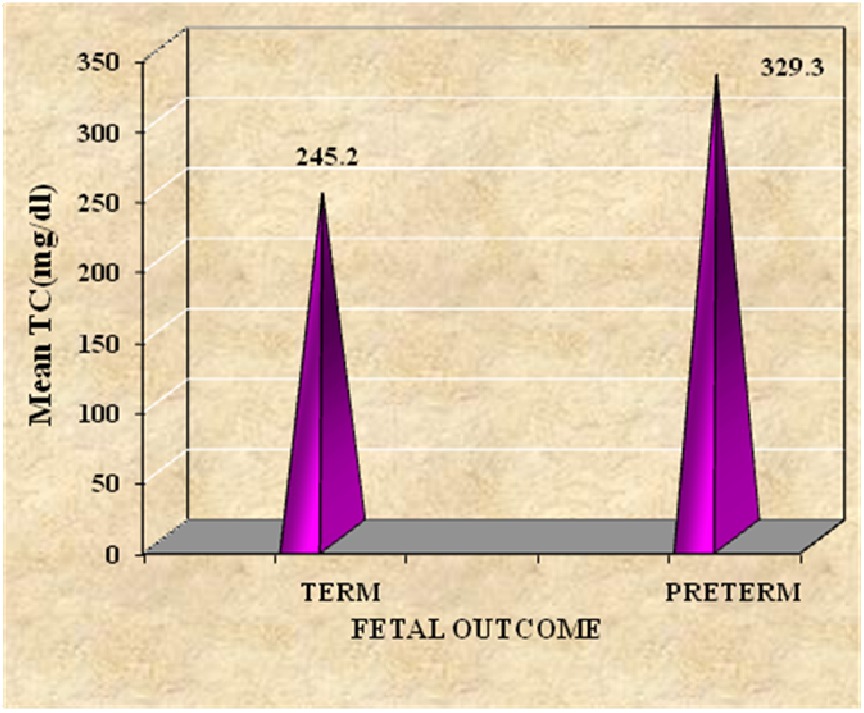


Table 10 : Serum Triglycerides and pregnancy outcome

Sr. TGL	No. of cases	Outcome of delivery			
		Good		Preterm	
		No	%	No	%
Normal	386	385	99.7	1	0.3
Abnormal	14	5	35.7	9	64.3
Sr. TGL Mean SD		275.2 77.3		411.3 50.5	
'p'		0.0001 Significant			

0.3 % of mothers with normal triglyceride values and 64.3% of mothers with abnormal values had preterm delivery. The mean TGL values of these two types of outcome were 275.5 and 411.3. These differences are statistically significant ($p < 0.05$).

T G L &
FETAL OUTCOME

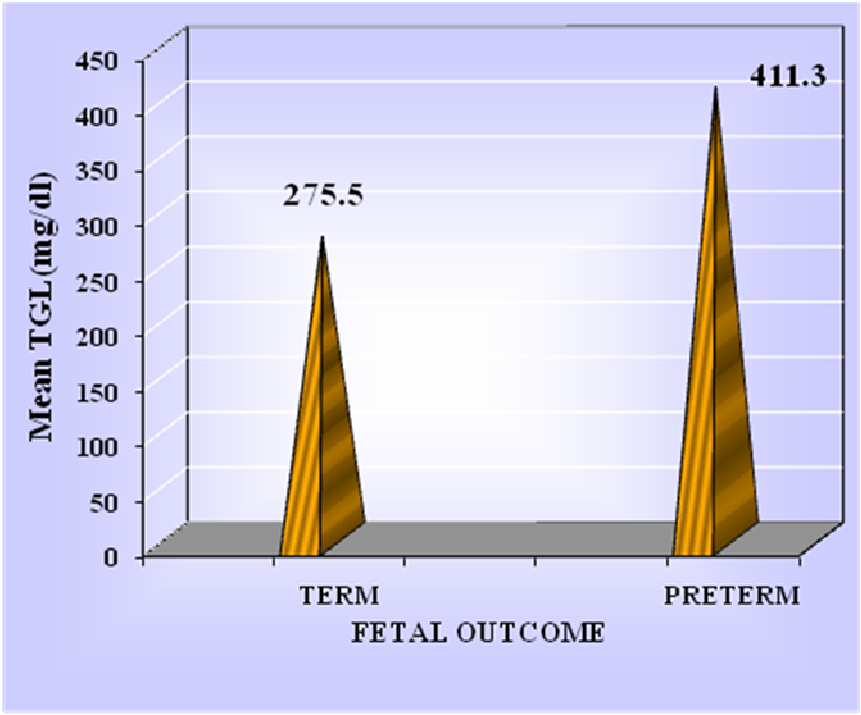


Table 11 : Outcome of delivery & Fetal Weight

Outcome of delivery	**Fetal Weight (in kgs)**	
	Mean	**SD**
Good	2.87	1.23
Preterm	1.93	0.16
'p'	**0.0001** **Significant**	

The mean fetal weight of the children delivered at term was significantly higher than that of the pre term children (p = 0.0oo1).

OUTCOME & FETAL WEIGHT

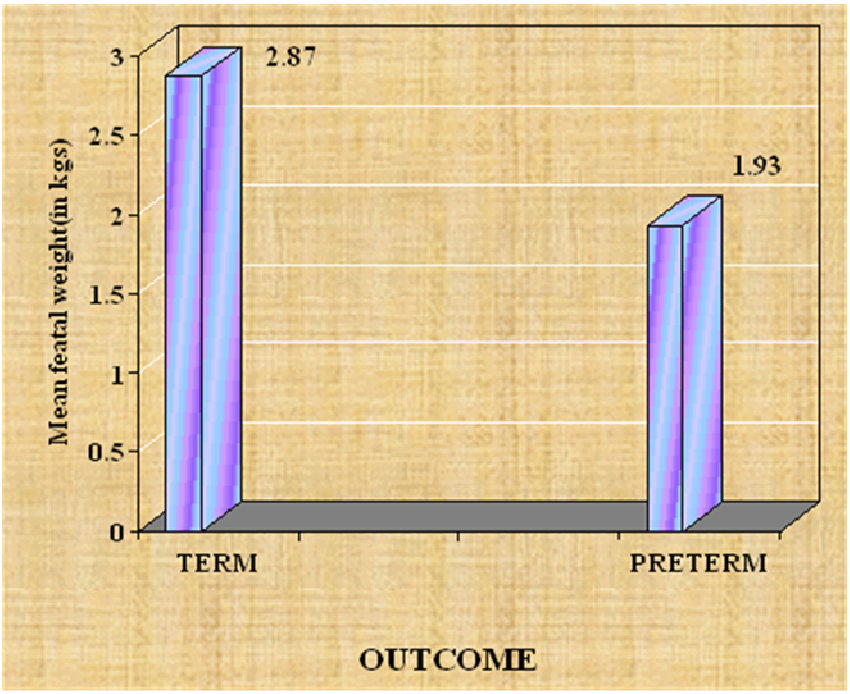
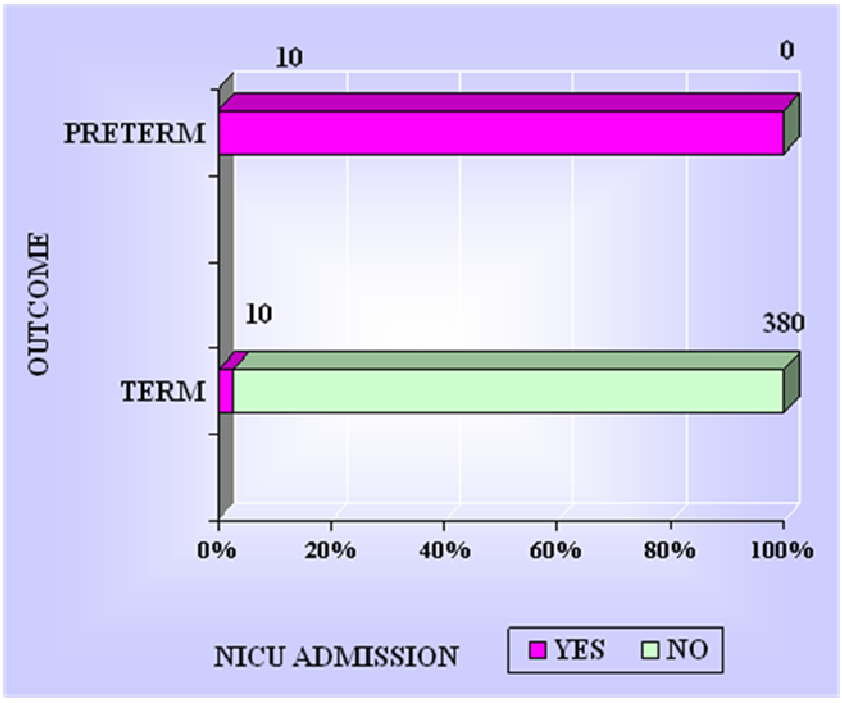


Table 12 : Outcome of delivery and NICU Admissions

Outcome of delivery	**No. of cases**	**NICU Admissions**			
		Yes		**No**	
		No	**%**	**No**	**%**
Term	390	10	2.6	380	97.4
Preterm	10	10	100	-	-
'p'	**0.0001** **Significant**				

The outcome of deliveries had significant association with NICU admissions. (p = 0.0001)..

OUTCOME & NICU ADMISSION



DISCUSSION

Preterm delivery is defined as birth occurring prior to 37 completed weeks gestation.incidence in india 10 – 14% and developed countries 5% to 10%. 400 antenatal mothers are taken for study

Their serum triglycerides and cholesterol values were collected.All the patients were followed till term and some of them delivered preterm.

American medical journal **OBSTETRICS AND GYNAECOLOGY** 2007, December 197 (6) 610. Cator jim, Bodnar studied in early pregnancy lipid concentration and spontaneous preterm brith.

In that case control study of women with spontaneous preterm brith,cholesterol, high density lipoprotein, low density lipoprotein, triglycerides were evalvated. lipid concentration and gestational changes as well as risk for preterm birth were evalvated in women who delivered < 34 weeks (n = 23) > or = 34 < 37 (n=67) and > or = 37 weeks (n = 199)

High cholesterol ,triglycerides < or = 15 weeks were associated with a 2.8 fold and 2.0 fold (1.0 -3.9) increased risk for preterm birth < 34 weeks and > or 34 < 37,respectively.overweight female who delivered < 34 weeks had particularly elevated early pregnancy concentrations of cholesterol and low density lipoprotein. lean female women with moderate preterm birth had increased triglycerides. There was a reduced triglycerides response in the first half of pregnancy among female who delivered < 34 weeks. Results indicate that the presence of dyslipidemia in female results spontaneous preterm birth our study us similar to it and our result are statistically significant.

In another study done by Rece ms,Mcgreor ja,Allen kg,Harris ma,amj **Obstetrics And Gynaecology** 1997 april 176 (4) – 907 14. A case-control study was conducted to find out the possible pathogenesis of preterm birth. Thirty-seven preterm (mean gestational age 34 weeks) and 34 control mother-baby dyads (gestational age 40 weeks) were evaluated. The maternal percent of total arachidonic acid in red blood cells and plasma was increased in preterm cases versus controls at delivery (3.8- and 1.6-fold, respectively, $p < 0.05$). Maternal red blood cell eicosapentaenoic acid (1.98 +/- 0.15, $p < 0.0001$) and omega-3/omega-6 ratios (0.58 +/- 0.22, $p < 0.009$) were lower in preterm cases than in controls at delivery (4.64 +/- 0.32 and 1.27 +/- 0.12, respectively). Docosapentaenoic acid, a marker of omega-3 essential fatty acid deficiency, was higher in preterm maternal red blood cells (1.26 +/- 0.18, $p < 0.0001$) and amnion (1.27 +/- 0.19, $p < 0.001$) compared with term controls (0.12 +/- 0.07 and 0.58 +/- 0.13, respectively). And the results are 1) altered essential fatty acid intake or metabolism in a portion of women delivered preterm and (2) increased maternal red blood cell arachidonic acid is associated with an increased risk of preterm birth.

In current study out of 400 Antenatal mothers 190 are primi and 210 are second gravida . Blood collected at 24, 28, 32 weeks , are respectively 192 , 154 , 54 mothers.

Serum Cholesterol And Outcome Of Delivery

Sr. cholesterol	No. of cases	Outcome of delivery			
		Good		Preterm	
		No	%	No	%
Normal	383	383	100	-	-
Abnormal	17	7	41.2	10	58.8
Sr. cholesterol Mean SD		245.2 39.5		329.3 25.3	
'p'		0.0001 Significant			

All the mothers with normal cholesterol values had good outcome whereas 58.8% of mothers with abnormal cholesterol values had preterm deliveries. This difference in statistically significant (p = 0.0001).

A study of Association of elevated free fatty acids during late pregnancy with preterm delivery Was conducted by Chen X, Scholl, Department of Obstetrics and Gynecology, University of Medicine and Dentistry of New Jersey-School of Osteopathic Medicine, Stratford, New Jersey, USA. In a prospective observational cohort with 523 healthy pregnant women, fasting plasma FFAs were measured during the third trimester. pregnancy outcomes were abstracted from medical record at delivery. And the conclusion was Elevated fasting plasma FFA levels at 30 weeks of gestation were associated with an increased risk of preterm delivery. This effect was independent of prepregnant obesity and several other known risk factors for preterm delivery, including cigarette smoking, ethnicity, and prior preterm delivery.

These data may have important clinical significance because they provide a possible link between preterm delivery and high lipid level.

In Current Study - Serum Triglycerides and Pregnancy Outcome

Sr. TGL	No. of cases	Outcome of delivery			
		Good		Preterm	
		No	%	No	%
Normal	386	385	99.7	1	0.3
Abnormal	14	5	35.7	9	64.3
Sr. TGL Mean SD		275.2 77.3		411.3 50.5	
'p'		0.0001 Significant			

0.3 % of mothers with normal triglyceride values and 64.3% of mothers with abnormal values had preterm delivery. The mean TGL values of these two types of outcome were 275.5 and 411.3. These differences are statistically significant ($p < 0.05$).

There are several limitations to this study. First some of the patients did not agree to participate the study . Their demographic , socioeconomic , or medical characteristics could bias outcome measures in some way although we believe any effect should be small . Our results from the specific ethnic groups may not be generalizable to other population . socioeconomic factor such as dietary intake may affect triglycerides and cholesterol concentration and risk .

Total cholesterol and triglycerides concentration was measured at 24 ,, 28, 32 weeks gestation .which was 3 to 6 weeks prior to the pre term delivery potentially provide additional information on risk. Finally , elevated maternal

triglycerides and cholesterol levels may play a role in the mechanism of underlying preterm delivery or may simply be a marker for risk of preterm delivery.

SUMMARY

- To evaluate the elevated serum triglycerides and cholesterol levels as a predictor of preterm delivery.
- The study group includes 400 uncomplicated pregnant women of 24 ,28, 32 weeks of gestation during the period September 2010 to October 2011 at Institute of social obstetrics and Govt Kasturba Gandhi hospital.
- From all the antenatal mothers included in the study the blood sample of serum triglycerides and cholesterol was taken after overnight fasting and were followed till delivery.
- In this study group age of the mother and outcome of delivery has no statistically significant.
- The study group with primis and second gravidas with preterm deliveryy has no statistically significant.
- The study group with normal cholesterol values had good outcome were as 58.8% study group with elevated cholesterol values had preterm delivery is statistically significant (p=0.0001)
- The study group with normal triglycerides of 0.3% and 64.3% of elevated triglycerides had preterm delivery. The mean of triglycerides values of the two types of outcome were 275.5 and 411.3 are statistically significant.
- In the current study elevated triglycerides and cholesterol levels was found to be simple marker for preterm delivery.

CONCLUSION

1. Serum Triglycerides and Cholesterol levels was evaluated in 400 antenatal mothers at 24, 28, 32 weeks of gestation with Fasting triglycerides and Cholesterol levels.
2. Serum Triglycerides and Cholesterol levels was found to be elevated in patients who have gone in for preterm labor than those gone for term pregnancy.
3. Hence Serum Triglycerides and Cholesterol levels has been found to be useful simple marker for preterm delivery.

PROFORMA

Name	Age
IP.No	Unit
Gravida	
Para	Last Menstrual Period (LMP)
Live	Expected date of Delivery
(EDD)	
Abortion	Corrected EDD(C.EDD)
SES	Menstrual cycle
Occupation	Height
Residence	Weight
Booked/Unbooked (UB)	
Immunized/Not	
DOA(Date of Admission)	
Duration of hospital stay	
DOD (Date of Discharge)	
period of gestation	

Present complaints

Lower abdominal pain

Dull low backache

Vaginal discharge

Fluid leaking per vaginum

Fever

UTI(urinary tract infection)

URI (Upper Respiratory Tract Infection)

Bleeding

Obstetric history

Trimester

Hyperemesis

Exanthematous fever

Bleeding

Radiation exposure

Medication

Pain abdomen

II.Trimester

Date of Quickening

Bleeding per vaginum

History of (H/O) PIH

H/O GDM(Gestational diabetes Mellitus)

III.Trimester

Bleeding per vaginum

UTI

Cervico vaginal infection

Coitus

Diabetes

Hypertension

Fever

Trauma

Past obstetric history

Previous child birth

H/O abortion

H/O Preterm labor

H/O Babies with congenitak anamolies

Past Medical History

Tuberculosis

Bronchial Asthma

STD (sexually Transmitted diseases)

Jaundice

Heart disease

Diabetes mellitus

Epilepsy

Renal disease

General examination

Temperature(T) Pallor Pedal Edema

PR BP RR RS CVS

Obstetric examination - Per abdomen

Investigations

Urine analysis

urine culture sensitivity

Complete Blood Count

Blood urea

Sugar

S.Creatinine

S.Electrolytes

VDRL

ECG

USG Abdomen

Featal Otcome

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S.NO	NAME	AGE	IP NO	OBSTETRIC CODE	LMP	EDD	BLOOD COLLECTION WEEKS	S.CHOLESTEROL	S. TRIGLYCERIDES	OUT COME	FETAL WEIGHT (KG)	NICU ADMISSION
1	LAKSHMI	25	3014	G2P1L1	02/03/10	09/12/10	24	180	103	TERM	2.8	NO
2	AMBIKA	24	3088	PRIMI	05/03/10	12/12/10	24	200	129	TERM	3.0	NO
3	GRACE	22	3725	PRIMI	23/05/10	30/02/11	24	210	138	TERM	2.7	NO
4	SHEEBA	27	3645	G2P1L1	29/06/10	06/04/11	28	290	150	TERM	2.8	NO
5	LALITHA	23	3212	G2P1L1	20/08/10	27/05/11	32	333	178	TERM	2.7	NO
6	LILLY	25	3423	PRIMI	15/03/10	21/12/10	28	232	236	TERM	2.9	NO
7	JEBA	21	7625	G2PIL1	24/08/10	31/05/11	24	230	321	TERM	2.7	NO
8	RAMYA	24	3545	PRIMI	18/03/10	26/12/10	28	218	287	TERM	2.9	NO
9	FATHIMA	22	3654	G2P1L1	11/09/10	18/06/11	28	236	376	TERM	2.9	NO
10	PRIYA	19	3767	PRIMI	22/07/10	29/04/11	32	280	345	TERM	2.8	NO
11	DEVI	20	3645	PRIMI	04/05/10	11/02/11	24	203	338	TERM	3.2	NO
12	ANNE	22	3256	G2P1L1	08/05/10	15/02/11	24	209	370	TERM	2.	NO
13	VEMBU	23	3897	G2P1L1	19/09/10	26/06/11	24	189	201	TERM	2.7	NO
14	KANIKA	21	3745	PRIMI	24/03/10	31/12/10	32	321	150	TERM	2.7	NO
15	VANI	25	3264	G2P1L1	23/06/10	29/03/11	24	183	189	TERM	2.8	NO
16	NITHYA	26	2546	G2P1L1	12/03/10	19/12/10	28	185	198	TERM	2.8	NO
17	RAJI	20	3612	PRIMI	30/06/10	07/04/11	24	194	220	TERM	2.8	NO
18	DIVIYA	22	3765	PRIMI	28/07/10	04/05/11	24	230	231	TERM	2.7	NO

19	PUSHPA	23	3243	G2P1L1	10/04/10	17/01/11	28	189	167	TERM	2.9	YES
20	USHA	19	3906	PRIMI	17/07/10	24/04/11	32	219	387	TERM	2.9	NO
21	MARIYAM	20	3712	PRIMI	13/04/10	20/01/11	24	243	145	TERM	2.9	NO
22	ANITHA	24	3456	G2P1L1	13/04/10	20/01/11	24	239	120	TERM	2.9	NO
23	AMBIKA	25	2434	G2P1L1	19/04/10	26/01/11	28	217	187	TERM	2.9	NO
24	SATHYA	23	3762	G2P1L1	21/05/10	28/02/11	32	329	267	TERM	2.8	NO
25	VANI	22	3154	G2P1L1	13/06/10	20/03/11	32	250	378	TERM	2.8	NO
26	MANJU	21	3651	PRIMI	03/06/10	10/03/11	24	198	154	TERM	2.8	NO
27	RANI	21	3871	PRIMI	07/07/10	14/04/11	24	182	138	TERM	2.8	NO
28	KUMARI	26	3908	G2P1L1	05/07/10	12/04/11	24	204	222	TERM	2.8	NO
29	NATHIYA	20	3710	PRIMI	08/04/10	15/01/11	24	220	287	TERM	2.8	NO
30	KOUSALYA	19	3004	PRIMI	11/04/10	18/01/11	28	232	375	TERM	2.8	NO
31	KALAI	19	3612	PRIMI	18/05/10	25/02/11	28	278	328	TERM	2.8	NO
32	BHARATHI	21	3817	G2P1L1	04/06/10	11/03/11	32	302	249	TERM	2.8	NO
33	THARANI	24	3945	G2P1L1	12/06/10	19/03/11	24	245	289	TERM	2.8	NO
34	SUKUMARI	20	3732	G2P1L1	24/07/10	1/05/11	28	145	328	TERM	2.8	NO
35	ANITHA	20	3767	PRIMI	22/08/10	29/05/11	24	219	210	TERM	2.7	NO
36	SUJI	25	3634	G2P1L1	28/03/10	04/12/10	28	201	207	TERM	2.7	NO
37	VALLI	22	3624	PRIMI	14/09/10	21/06/11	28	228	302	TERM	2.7	YES
38	RAMYA	24	3898	G2P1L1	11/12/10	18/09/11	24	275	189	TERM	2.8	NO
39	SHREYA	23	3909	G2P1L1	15/11/10	22/08/11	24	210	143	TERM	2.8	NO

40	BLESSY	21	3709	PRIMI	25/11/10	02/09/11	32	289	378	TERM	2.8	NO
41	JAMILA	22	3203	G2P1L1	15/12/10	22/09/11	24	190	345	TERM	2.8	NO
42	MALIKA	22	3150	G2P1L1	12/08/10	19/05/11	28	230	298	TERM	2.9	NO
43	SHANTHI	20	3265	PRIMI	10/10/10	17/07/11	28	335	421	PRETER M-32 WKS	1.850	YES
44	JAYA	20	4512	G2P2L1	24/10/10	31/07/11	24	178	165	TERM	2.6	NO
45	MARY	19	2369	PRIMI	22/03/10	29/12/10	24	238	113	TERM	2.6	NO
46	MALLI	23	5125	PRIMI	24/04/10	31/01/11	28	223	376	TERM	2.8	NO

47	SHEELA	22	2487	G2P1L1	12/03/10	19/09/11	28	178	139	TERM	2.7	NO
48	RAGA	21	1265	G2P1L1	15/11/10	22/08/11	28	200	298	TERM	2.7	NO
49	RAJI	22	2356	G2P1L1	25/12/10	O1/09/11	28	243	234	TERM	2.7	NO
50	AJITHA	23	1478	G2P1L1	02/12/10	09/09/11	24	184	194	TERM	2.7	YES
51	JAYA	21	2698	PRIMI	04/04/10	11/01/11	28	208	320	TERM	2.7	NO
52	ELAVARASI	25	3214	G2P1L1	22/03/10	29/12/10	28	214	289	TERM	2.7	NO
53	MARY	19	2358	PRIMI	08/09/10	15/06/11	32	323	410	TERM	2.8	NO
54	JANCY	20	1698	PRIMI	20/03/10	27/12/10	28	180	225	TERM	2.7	NO
55	ALAMELU	26	3985	G2P1L1	13/05/10	20/02/10	28	190	298	TERM	2.9	NO
56	SHALINI	25	1956	G2P1L1	14/11/10	21/08/11	24	184	148	TERM	2.9	NO

57	RATHI	24	1265	G2P1L1	15/08/10	22/05/11	28	234	303	TERM	2.7	NO
58	SIVARANJANI	21	1598	PRIMI	09/09/10	16/06/11	28	188	256	TERM	2.9	NO
59	JANCY	22	2589	G2P1L1	05/05/10	12/02/11	24	190	175	TERM	2.9	NO
60	KALAIVANI	19	1325	PRIMI	18/10/10	25/07/11	24	194	245	TERM	2.9	NO
61	NANDHINI	19	2698	PRIMI	21/09/10	28/06/11	24	223	265	TERM	2.7	NO
62	KANMANI	20	2969	PRIMI	11/07/10	18/04/11	28	256	320	TERM	2.7	NO
63	SAROJA	24	1569	G2P1L1	8/03/10	15/12/10	24	270	332	TERM	2.7	NO
64	GAYATHRI	23	2365	G2P1L1	12/03/10	19/12/10	24	286	302	TERM	2.7	NO
65	KAVITHA	23	4865	G2P1L1	15/10/10	22/07/11	24	285	234	TERM	3.5	NO
66	KANIKA	23	2314	G2P1L1	19/10/10	26/07/11	24	245	278	TERM	2.8	NO
67	CLARA	26	1856	G2P1L1	04/11/10	11/08/11	28	196	245	TERM	2.6	NO
68	SHEELA	21	5369	PRIMI	18/11/10	25/08/11	32	220	387	TERM	2.8	YES
69	THARA	20	4236	PRIMI	20/11/10	27/08/11	24	314	402	PRETERM-32 WKS	1.9	YES
70	PUSHPA	19	2658	PRIMI	22/11/10	29/08/11	28	188	329	TERM	2.6	NO
71	TAMIL	23	2159	G2P1L1	08/04/10	15/01/11	28	179	315	TERM	2.7	NO
72	SOBANA	21	3698	G1P1L1	03/07/10	10/04/11	28	306	278	PRETERM-34 WKS	2.2	YES
73	KAVYA	23	2489	G2P1L1	20/03/10	27/12/10	32	250	328	TERM	2.9	NO
74	KIRUTHIKA	24	2178	G2P1L1	24/05/10	31/02/11	32	224	298	TERM	2.9	NO
75	JAYANTHI	22	2695	PRIMI	13/04/10	20/01/11	24	228	219	TERM	2.8	NO

76	SOLAIYAMMA	21	3125	PRIMI	16/08/10	23/05/11	24	218	245	TERM	2.8	NO
77	SUGANTHI	22	3254	PRIMI	12/07/10	19/04/11	28	187	312	TERM	2.8	NO
78	MALAR	20	2985	PRIMI	20/05/10	27/03/11	24	198	124	TERM	2.9	NO
79	REVATHI	27	2569	G2P1L1	21/04/10	27/01/11	24	196	130	TERM	2.9	YES
80	SUGANYA	26	2489	G2P1L1	19/06/10	26/03/11	24	194	142	TERM	2.9	NO
81	RATHIKA	21	2658	PRIMI	16/06/10	25/03/11	28	226	150	TERM	2.9	NO
82	SANGEEAH	23	2478	PRIMI	02/04/10	09/01/11	24	208	126	TERM	3.3	NO
83	SUGANYA	24	3432	G2P1L1	09/04/10	16/01/11	24	246	234	TERM	2.9	NO
84	CHANDRA	21	4356	PRIMI	24/04/10	31/01/11	24	268	168	TERM	2.8	NO
85	MAGALAM	23	4367	PRIMI	13/08/10	20/05/11	28	278	142	TERM	2.8	NO
86	MANOGARI	24	2435	G2P1L1	24/03/10	31/12/10	32	256	152	TERM	2.8	NO
87	SUBHA	25	3367	G2P1L1	10/03/10	17/12/10	32	286	168	TERM	2.8	YES
88	JAYALAKSHMI	23	3278	G2P1L1	08/05/10	15/02/11	28	185	224	TERM	2.8	NO
89	RAJALAKSHMI	21	4398	G2P1L1	19/06/10	26/03/11	24	189	238	TERM	2.7	NO
90	NATHIYA	22	2478	PRIMI	20/07/10	27/04/11	24	192	102	TERM	2.7	NO
91	DIVIYA	20	3248	PRIMI	20/07/10	27/04/11	24	244	234	TERM	3.1	NO
92	KALAIVANI	21	3125	G2P1L1	21/08/10	18/05/11	24	186	110	TERM	2.9	NO
93	CHITHRA	23	4685	G2P1L1	02/07/10	09/04/11	28	230	168	TERM	2.8	NO
94	KAVITHA	21	2985	PRIMI	08/04/10	15/01/11	28	240	180	TERM	2.9	NO
95	KRISHNAVENI	20	2487	PRIMI	15/08/10	22/05/11	32	254	324	TERM	2.8	NO
96	PRIYA	20	2698	PRIMI	04/05/10	11/02/11	24	198	184	TERM	2.9	NO

97	ANUSHYA	21	2147	G2P1L1	09/09/10	16/06/11	32	248	254	TERM	2.8	NO
98	AMMU	21	2985	PRIMI	20/05/10	27/02/11	24	186	164	TERM	2.9	NO
99	ANUJA	20	3248	PRIMI	17/04/10	24/01/11	28	243	174	TERM	2.9	NO
100	POORNA	21	2145	PRIMI	19/07/10	26/04/11	28	254	194	TERM	2.9	NO
101	SEETHA	27	2985	G2P1L1	01/03/10	08/12/10	24	259	120	TERM	2.8	NO
102	RANI	23	1698	G2P1L1	05/05/10	12/02/11	32	397	472	PRETER M-32 WKS	1.950	YES
103	SUDHA	22	1789	PRIMI	16/06/10	23/03/11	28	183	86	TERM	2.7	NO
104	KAMAKSHI	21	2536	PRIMI	19/07/10	26/04/11	24	198	124	TERM	2.7	NO
105	ROSE	24	4289	G2P1L1	22/04/10	29/01/11	32	224	254	TERM	2.8	NO
106	ANITHA	25	3269	G2P1L1	23/06/10	30/03/11	32	324	260	TERM	2.8	NO
107	LAVANYA	20	2564	PRIMI	01/04/10	08/01/11	24	186	98	TERM	2.8	NO
108	SWETHA	20	3254	PRIMI	03/06/10	10/03/11	28	192	221	TERM	2.8	NO
109	PRADEEPA	23	2541	G2P1L1	07/07/10	14/04/11	32	240	345	TERM	2.7	NO
110	RENUKA	21	2985	PRIMI	11/04/10	18/01/11	24	244	134	TERM	2.7	NO
111	MALATHI	22	2415	PRIMI	19/04/10	26/01/11	28	254	234	TERM	2.9	NO
112	SAVITHA	22	2365	G2P1L1	20/04/10	27/01/11	32	250	345	TERM	3.0	YES
113	BARANI	21	2376	G2P1L1	21/05/10	28/02/11	24	182	98	TERM	2.9	NO
114	PAVITHRA	19	2398	PRIMI	23/07/10	30/04/11	24	224	214	TERM	2.9	NO
115	RAJAKUMARI	19	2487	PRIMI	23/07/10	30/04/11	24	194	234	TERM	2.7	NO
116	DEEPA	21	1568	PRIMI	30/04/10	07/04/11	24	224	324	TERM	2.7	NO

117	SANGETA	22	1267	G2P1L1	18/07/10	26/04/11	28	274	364	TERM	2.7	NO
118	AGALYA	21	2359	PRIMI	11/03/10	18/12/10	24	333	430	PRETERM-32 WKS	2.0	YES
119	SARANYA	23	3256	G2P1L1	17/07/10	24/04/11	28	234	235	TERM	2.7	NO
120	SELVI	25	1258	G2P1L1	20/05/10	27/02/11	28	198	324	TERM	2.7	NO
121	NARMATHA	26	1478	G2P1L1	14/05/10	21/02/11	28	264	368	TERM	2.7	NO
122	AMBIKA	23	2698	G2P1L1	18/04/10	25/01/11	24	244	144	TERM	2.7	NO
123	SARITHA	21	2369	PRIMI	20/07/10	27/04/11	24	224	124	TERM	2.8	NO
124	SARASWATHI	21	1498	PRIMI	08/05/10	15/02/11	24	186	156	TERM	3.250	NO
125	SATHYA	24	2541	G2P1L1	01/09/10	O8/06/11	32	254	442	TERM	2.8	NO
126	LATHA	24	3012	G2P1L1	20/05/10	27/02/11	28	246	136	TERM	2.9	NO
127	SAFEEBA	23	2325	G2P1L	10/07/10	17/04/11	24	244	146	TERM	2.9	NO
128	UMA	21	2486	PRIMI	19/08/10	26/06/11	24	186	158	TERM	2.9	YES
129	SHAKELA	20	2148	PRIMI	20/04/10	27/01/11	24	202	176	TERM	2.9	NO
130	SHYLAJA	20	2963	PRIMI	22/08/10	30/05/11	28	319	431	PRETERM-34 WKS	2.0	YES
131	VIJAYA	19	3058	PRIMI	29/08/10	05/06/11	28	265	268	TERM	2.8	NO
132	SRIDEVI	19	3045	PRIMI	10/04/10	17/01/11	28	278	324	TERM	2.7	NO
133	MANIMEGALAI	24	1258	G2P1L1	16/05/10	21/02/11	24	184	224	TERM	2.8	NO
134	SATHYA	23	1632	G2P1L1	17/07/10	24/03/11	28	196	256	TERM	2.8	NO
135	PRIYA	22	2589	G2P1L1	30/09/10	07/07/11	24	212	345	TERM	2.7	NO

136	DEVIPRIYA	19	1523	PRIMI	01/03/10	08/12/10	32	310	324	TERM	2.8	NO
137	VANI	25	1473	G2P1L1	05/05/10	12/03/11	24	186	234	TERM	2.7	NO
138	INDHU	26	1787	G2P1L1	09/07/10	16/04/11	24	192	245	TERM	2.7	NO
139	NISHA	27	2386	G2P1L1	19/04/10	25/01/11	24	180	265	TERM	2.7	NO
140	RASATHI	22	3086	PRIMI	20/05/10	27/02/11	28	288	276	TERM	2.7	NO
141	PADMA	23	2853	G2P1L1	18/03/10	25/12/10	28	268	284	TERM	2.7	NO
142	GAYATHRI	21	2586	PRIMI	09/03/10	16/12/10	24	232	123	TERM	2.7	NO
143	BHARATHI	21	2185	PRIMI	19/05/10	26/02/11	24	195	145	TERM	2.8	NO
144	BAKYA	24	2954	G2P1L1	15/07/10	22/04/11	28	262	164	TERM	2.8	NO
145	PARAMESWARI	20	3258	PRIMI	10/04/10	17/01/11	32	280	346	TERM	2.8	NO
146	VALARMATHI	25	2145	G2P1L1	20/08/10	27/05/11	24	194	184	TERM	2.8	NO
147	SUNDARI	22	2698	PRIMI	24/04/10	31/01/11	24	184	196	TERM	2.8	NO
148	PAVALAM	21	2478	PRIMI	18/04/10	25/01/11	28	198	276	TERM	2.8	YES
149	SAVAGAMI	21	2563	PRIMI	10/05/10	17/03/11	28	232	321	TERM	2.8	NO
150	SASIKALA	23	3021	G2P1L1	18/06/10	25/03/11	28	278	325	TERM	2.8	NO
151	GOMATHI	20	3549	PRIMI	10/04/10	17/01/11	28	212	378	TERM	2.8	NO
152	MAINA	24	2145	G2P1L1	11/05/11	18/02/11	24	243	245	TERM	2.8	NO
153	ARULMOZHI	25	2658	G2P1L1	20/06/10	27/02/11	24	267	193	TERM	2.8	NO
154	KAMAKSHI	23	3021	G2P1L1	21/05/10	28/02/11	24	189	356	TERM	2.8	NO
155	USHA	23	2136	G2P1L1	10/03/10	17/12/10	28	198	420	TERM	2.8	YES
156	DEVI	21	2863	PRIMI	08/06/10	15/03/11	24	200	383	TERM	3.3	NO

157	USHA RANI	20	2765	PRIMI	02/10/10	09/07/11	24	278	343	TERM	2.7	NO
158	RADHIKA	21	2154	G2P1L1	23/04/10	30/01/11	28	356	287	TERM	2.7	NO
159	POORAKALA	20	2031	PRIMI	10/05/10	17/02/11	28	239	231	TERM	2.7	NO
160	RAMADEVI	21	3025	G2P1L1	21/04/10	28/01/11	32	310	403	TERM	2.7	NO
161	SREJA	24	1203	G2P1L1	24/07/11	01/05/11	24	239	254	TERM	2.7	NO
162	GAYATHRI	25	2691	G2P1L1	10/07/10	17/04/11	28	235	345	TERM	2.7	NO
163	RENUKA	26	2013	G2P1L1	03/07/10	10/04/11	24	293	367	TERM	2.7	NO
164	RAMANI	24	2325	G2P1L1	02/04/10	09/01/11	24	234	317	TERM	2.7	NO
165	VENNILA	23	2486	PRIMI	08/04/10	15/01/11	28	211	324	TERM	2.7	NO
166	POONGODI	21	2148	PRIMI	07/08/10	14/06/11	24	203	372	TERM	27	NO
167	MYTHILI	24	2963	G2P1L1	03/06/10	10/03/11	24	243	341	TERM	2.7	NO
168	RAMA RANI	25	3058	G2P1L1	01/04/10	08/01/11	32	278	271	TERM	2.7	NO
169	AMUDHA	21	3065	PRIMI	09/06/10	16/03/11	24	231	241	TERM	2.9	NO
170	CHANDRA	24	3189	G2P1L1	19/04/10	26/01/11	28	238	285	TERM	2.9	NO
171	MALLIGA	23	1632	G2P1L1	20/06/10	27/03/11	22	278	310	TERM	2.8	NO
172	HEME	21	2147	PRIMI	19/04/10	26/01/11	24	273	356	TERM	2.8	NO
173	SANTHI	25	2369	G2P1L1	15/04/10	22/01/11	32	323	430	TERM	3.1	NO
174	KARPAGAM	21	2541	PRIMI	11/03/10	18/12/10	24	269	289	TERM	2.8	NO
175	MEENAKSHI	23	3086	G2P1L1	06/06/10	13/03/11	24	261	231	TERM	2.8	NO
176	RASATHI	23	2147	G2P1L1	12/07/10	19/04/11	28	256	158	TERM	2.8	NO
177	KANNAMA	21	3651	PRIMI	22/9/10	29/06/11	24	203	189	TERM	2.8	NO

178	KUMUTHA	26	1205	G2P1L1	05/10/10	12/07/11	28	206	241	TERM	2.8	NO
179	SELVI	23	1682	PRIMI	13/11/10	20/08/11	28	243	253	TERM	2.9	NO
180	RANI	21	2698	PRIMI	02/12/10	09/10/11	28	269	264	TERM	2.9	NO
181	RAMA	23	3258	G2P1L1	19/09/10	26/06/11	28	265	321	TERM	2.8	NO
182	KUMARI	21	1258	PRIMI	21/07/10	28/04/11	24	236	387	TERM	2.9	NO
183	MANI	22	2596	G2P1L1	02/05/10	09/02/11	28	301	245	TERM	2.8	NO
184	SIVAGAMI	20	3254	PRIMI	07/06/10	14/03/11	28	310	356	TERM	2.8	NO
185	SUSILA	20	1286	PRIMI	11/08/10	18/05/11	28	278	381	TERM	2.8	NO
186	THENMOZHI	21	3256	PRIMI	05/04/10	12/01/11	28	211	360	TERM	2.8	NO
187	JAMUNA	23	1586	G2P1L1	22/04/10	29/01/11	28	287	343	TERM	2.8	NO
188	VASANTHI	21	2158	G2P1L1	06/07/10	13/04/11	28	256	385	TERM	2.8	NO
189	STELLA	20	3589	PRIMI	14/11/10	21/09/11	28	287	398	TERM	2.8	NO
190	VIJAYA	24	3546	G2P1L1	20/09/10	27/06/11	24	310	245	TERM	2.8	NO
191	LORETTA	23	3521	G2P1L1	10/09/10	17/06/11	32	323	428	TERM	2.8	NO
192	NANDHINI	22	3387	PRIMI	16/08/10	13/06/11	24	322	328	TERM	2.8	NO
193	SANKU	25	3567	G2P1L1	03/07/10	10/04/11	28	265	245	TERM	2.9	NO
194	RAM THAI	24	1586	G2P1L1	18/08/10	25/06/11	24	239	237	TERM	2.9	NO
195	HEMAVATHI	22	3698	G2P1L1	03/07/10	10/04/11	28	245	356	TERM	2.9	NO
196	JERON	21	1258	PRIMI	07/06/10	14/03/11	24	231	376	TERM	3.2	NO
197	CELLIN	21	1263	PRIMI	13/06/10	20/06/11	24	180	321	TERM	2.9	NO
198	MUMTAJ	20	3248	PRIMI	22/12/10	29/10/11	28	188	321	TERM	2.8	NO

199	AYESHA	20	1526	G2P1L1	06/11/10	13/09/10	28	204	345	TERM	2.9	NO
200	SUSELA	21	3698	PRIMI	02/03/10	09/12/10	32	321	356	TERM	2.8	NO
201	SUDHA	24	2148	G2P1L1	07/08/10	14/05/11	28	245	276	TERM	2.8	NO
202	JANAKI	24	1589	G2P1L1	02/06/10	09/03/11	24	231	245	TERM	2.8	NO
203	BEGAM	21	2365	G2P1L1	13/08/10	20/05/11	24	256	289	TERM	2.8	YES
204	SHAJITHA	20	1258	PRIMI	10/06/10	17/03/11	28	251	254	TERM	2.8	NO
205	CHITRA	20	1693	PRIMI	11/05/10	18/02/11	28	287	278	TERM	2.8	NO
206	PREMA	19	2485	PRIMI	06/07/10	13/04/11	28	265	320	TERM	2.8	NO
207	ROHINI	21	3233	PRIMI	12/08/10	19/06/11	28	249	310	TERM	2.8	NO
208	INDRA	20	3256	PRIMI	22/05/10	29/02/11	24	232	378	TERM	2.9	NO
209	AKSHYA	23	3346	G2P1L1	10/07/10	17/04/11	24	274	329	TERM	2.9	NO
210	VALLI	21	5645	G2P1L1	05/03/10	12/12/10	24	245	354	TERM	2.9	NO
211	SALIMA	19	5521	PRIMI	09/08/10	16/05/11	32	303	400	TERM	3.0	NO
212	BAKYAVATHI	20	3212	PRIMI	11/04/10	18/01/11	24	212	378	TERM	2.8	NO
213	DURGADEVI	20	3894	G2P1L1	08/11/10	15/09/11	24	235	329	TERM	2.8	NO
214	ASLIMA	26	3583	G2P1L1	11/12/10	18/10/11	24	267	310	TERM	2.9	NO
215	PACHAYAMMA	22	2635	PRIMI	03/11/10	10/09/11	32	287	234	TERM	2.9	NO
216	NAKISBANU	21	1258	PRIMI	02/10/10	19/07/11	28	245	230	TERM	2.9	NO
217	MANGAI	19	1369	PRIMI	03/12/10	10/10/11	28	265	271	TERM	2.9	NO
218	MAKALAKSHMI	24	2569	G2P1L1	05/06/10	12/03/11	28	287	274	TERM	2.9	NO
219	KALPANA	23	3256	G2P1L1	04/07/10	11/04/11	28	267	256	TERM	2.8	NO

220	GANDHIMADHI	25	3025	G2P1L1	23/10/10	30/07/11	24	231	286	TERM	2.8	NO
221	VEEDAVALLI	22	3058	PRIMI	22/05/10	29/02/11	24	271	210	TERM	2.8	NO
222	RASATHI	21	1872	PRIMI	21/09/10	28/06/11	24	234	254	TERM	2.8	NO
223	MUTHULAKSHMI	22	3242	G2P1L1	13/09/10	20/06/11	24	345	278	TERM	2.8	NO
224	ANNALAKSHMI	21	9878	G2P1L1	14/07/10	21/04/11	28	256	320	TERM	2.7	YES
225	RAGINI	20	4378	G2P1L1	13/05/10	20/02/11	32	278	419	TERM	2.7	NO
226	BALA	20	6574	PRIMI	11/06/10	18/06/11	24	267	310	TERM	2.7	NO
227	GIRIJA	19	3478	PRIMI	02/07/10	09/04/11	24	287	320	TERM	2.7	NO
228	JERCY	23	9845	G2P1L1	09/08/10	16/05/11	24	213	129	TERM	2.7	NO
229	DAICY	23	3456	G2P1L1	08/10/10	15/07/11	24	327	411	PRETERM-35 WKS	2.3	YES
230	PARIMALA	21	3236	G2P1L1	11/09/10	18/06/11	28	267	289	TERM	2.9	NO
231	SUMITHRA	22	1269	G2P1L1	03/08/10	10/05/11	28	289	365	TERM	2.9	NO
232	PRAMA	22	2589	G2P1L1	03/09/10	10/06/11	28	298	367	TERM	2.9	NO
233	ARTHI	20	3254	PRIMI	08/09/10	15/06/11	24	234	256	TERM	3.250	NO
234	GANGA	20	2458	PRIMI	11/08/10	18/05/11	24	222	365	TERM	2.9	NO
235	NAGALAKSHMI	25	1589	G2P1L1	22/10/10	29/07/11	24	221	345	TERM	2.9	NO
236	MANGAI	23	1269	G2P1L1	16/04/10	23/01/11	24	256	310	TERM	2.7	NO
237	MANJULA	21	1489	G2P1L1	18/07/10	15/04/11	24	246	256	TERM	2.8	NO
238	JOTHI	21	1278	PRIMI	21/06/10	28/03/11	32	324	405	TERM	2.8	NO

239	GEETHA	20	1498	PRIMI	06/03/10	13/12/10	28	240	245	TERM	2.8	NO
240	PRABHA	20	3241	G2P1L1	12/09/10	19/06/11	28	200	256	TERM	2.8	NO
241	LALITHA	21	3214	G2P1L1	13/09/10	20/06/11	28	204	289	TERM	2.7	NO
242	SENBAGAM	23	2589	G2P1L1	10/08/10	17/05/11	28	278	235	TERM	2.8	NO
243	ANANDHI	23	3069	G2P1L1	08/04/10	15/01/11	28	280	276	TERM	2.7	NO
244	KOKILA	21	2019	PRIMI	06/03/10	13/12/10	24	236	345	TERM	2.8	NO
245	LALITHA	20	2569	PRIMI	08/07/10	15/04/11	24	251	323	TERM	2.7	NO
246	JASMINE	24	1258	G2P1L1	10/11/10	17/09/11	32	302	421	TERM	2.8	NO
247	SAGAYAM	25	1369	G2P1L1	03/09/10	10/06/11	24	289	328	TERM	3.0	NO
248	TAMILSELVI	24	3210	G2P1L1	23/03/10	30/12/10	24	213	197	TERM	2.7	NO
249	BARANI	24	2147	G2P1L1	14/08/10	21/05/11	24	187	231	TERM	2.8	NO
250	ELAKIYA	19	3256	PRIMI	12/09/10	19/06/11	24	289	252	TERM	2.8	NO
251	PECHI	19	1523	PRIMI	22/04/10	29/01/11	24	245	263	TERM	2.8	NO
252	SHARMILA	23	1528	G2P1L1	14/05/10	21/02/11	24	265	287	TERM	2.8	NO
253	MUMTAJ	21	1278	G2P1L1	07/08/10	14/05/11	32	321	304	TERM	2.9	NO
254	PONGAVANAM	21	1398	G2P1L1	08/07/10	15/04/11	28	234	210	TERM	2.9	YES
255	JENITHA	20	2376	PRIMI	06/03/10	13/12/11	28	211	237	TERM	2.9	NO
256	REVATHI	20	2145	PRIMI	11/10/10	18/07/11	28	287	237	TERM	2.7	NO
257	RANI	24	2156	G2P1L1	21/08/10	28/05/11	28	240	283	TERM	2.7	NO
258	MUNIYAMMAL	24	1289	G2P1L1	13/07/10	20/04/11	28	243	238	TERM	2.8	NO
259	LAVANYA	23	3412	G2P1L1	10/07/10	17/04/11	32	298	376	TERM	2.8	NO

260	JOTHIKA	22	4356	G2P1L1	22/08/10	29/05/11	32	248	190	TERM	2.8	NO
261	SARANYA	21	3421	PRIMI	22/03/10	29/12/10	24	256	321	TERM	2.8	NO
262	PONKODI	26	3521	G2P1L1	03/07/10	10/04/11	24	287	327	TERM	2.8	NO
263	REKHA	23	9879	G2P1L1	02/08/10	09/05/11	24	280	370	TERM	2.8	NO
264	THILAGAVATHI	23	9687	G2P1L1	10/07/10	17/04/11	24	187	301	TERM	2.8	NO
265	PUSHPA	21	9578	PRIMI	12/07/10	19/04/11	24	287	267	TERM	2.8	NO
266	PONMANI	21	9456	PRIMI	21/03/10	28/12/10	24	190	287	TERM	2.8	NO
267	RASAMMA	20	9367	PRIMI	09/04/10	16/01/11	32	331	402	TERM	3.125	NO
268	MURUGAMMA	20	9234	G2P1L1	10/04/10	17/01/11	28	276	290	TERM	2.9	NO
269	RAJI	19	9658	PRIMI	15/05/10	22/02/11	28	245	304	TERM	2.7	NO
270	JANANI	19	2589	PRIMI	06/07/10	13/04/11	24	287	376	TERM	2.8	NO
271	FATHIMA	25	1478	G2P1L1	22/04/10	29/01/11	24	256	329	TERM	2.8	YES
272	SHABEBA	24	2698	G2P1L	11/03/10	18/12/10	28	245	287	TERM	2.7	NO
273	SARMILA	23	3298	G2P1L1	03/08/10	10/05/11	28	267	267	TERM	2.8	NO
274	REHIMA	23	1789	G2P1L1	05/07/10	12/04/11	28	240	243	TERM	2.8	NO
275	REKHA	22	1589	PRIMI	12/08/10	19/05/11	28	210	290	TERM	2.8	NO
276	ROHINI	22	5690	PRIMI	11/09/10	18/06/11	32	278	432	TERM	2.7	NO
277	MARY	21	5681	PRIMI	10/08/10	17/05/11	28	276	178	TERM	2.7	NO
278	SANTHA	20	5678	PRIMI	22/09/10	19/06/11	28	234	195	TERM	2.7	NO
279	THASEEN	20	5674	G2P1L1	14/07/10	21/04/11	24	237	242	TERM	2.8	NO
280	RASATHI	25	5671	G2P1L1	15/08/10	22/05/11	24	243	248	TERM	2.8	NO

281	FARITHABANU	24	5658	G2P1L1	11/09/10	18/06/11	32	321	418	TERM	2.8	NO
282	INDHIRA	23	5655	G2P1L1	13/06/10	20/03/11	24	276	317	TERM	2.8	NO
283	MANGALAM	21	3256	G2P1L1	11/07/10	18/04/11	32	330	403	TERM	2.8	NO
284	JERINA	23	1896	G2P1L1	08/06/10	15/03/11	28	264	320	TERM	2.8	NO
285	THEENA	22	2596	G2P1L1	06/09/10	13/06/11	28	201	323	TERM	3.1	NO
286	HEMAVATHI	21	1478	G2P1L1	15/07/10	22/04/11	28	189	256	TERM	2.8	NO
287	MOHANA	20	3259	PRIMI	22/09/10	29/06/11	28	204	230	TERM	2.8	NO
288	RAMYA	20	1477	PRIMI	13/05/10	20/02/11	24	253	267	TERM	2.9	NO
289	SUNDHARI	23	1234	G2P1L1	22/05/10	29/02/11	24	264	276	TERM	2.8	NO
290	SOWMIYA	21	1243	PRIMI	11/08/10	18/05/11	24	271	248	TERM	2.8	NO
291	VANITHA	20	2351	G2P1L1	04/09/10	11/06/11	24	275	301	TERM	2.8	NO
292	GOWRI	25	1247	G2P1L1	03/07/10	10/04/11	24	240	321	TERM	2.7	NO
293	BHAVANI	23	2134	G2P1L1	12/10/10	19/07/11	24	263	326	TERM	2.7	NO
294	SUGANDHI	22	2256	G2P1L1	08/07/10	15/04/11	32	290	320	TERM	2.7	NO
295	RANGITHA	21	2378	PRIMI	21/07/10	28/04/11	28	243	345	TERM	2.6	NO
296	DEEPA	24	2366	G2P1L1	22/08/10	29/05/11	28	294	359	TERM	2.6	NO
297	SHALIMA	23	2389	G2P1L1	05/08/10	12/05/11	28	203	329	TERM	2.8	NO
298	RENU	20	2398	PRIMI	21/07/10	28/04/11	24	316	427	PRETERM-34 WKS	2.1	YES
299	ESWARI	20	2872	G2P1L1	22/08/10	29/05/11	32	325	385	TERM	2.8	NO
300	VASANTHI	21	2543	PRIMI	09/06/10	16/03/11	24	183	345	TERM	2.6	NO

301	ELAVARASI	19	2532	PRIMI	08/07/10	15/04/11	24	192	303	TERM	2.9	NO
302	RAGALAKSHMI	20	2567	PRIMI	11/09/10	18/06/11	24	234	320	TERM	2.9	NO
303	JAYANTHI	20	2598	PRIMI	22/07/10	29/04/11	24	238	289	TERM	2.9	NO
304	MALATHI	23	2556	PRIMI	21/05/10	28/02/11	24	249	321	TERM	2.9	NO
305	ROHINI	25	2578	G2P1L1	02/04/10	09/01/11	24	263	182	TERM	2.7	NO
306	RADHA	22	2613	PRIMI	04/09/10	11/06/11	24	261	178	TERM	2.7	NO
307	CHANDRIKA	21	2615	PRIMI	07/07/10	14/04/11	32	340	402	TERM	3.2	NO
308	MUTHULAKSHMI	21	2619	PRIMI	12/06/10	19/03/11	32	276	343	TERM	2.7	NO
309	THANGAM	20	2530	PRIMI	08/05/10	15/02/11	24	234	249	TERM	2.8	NO
310	ELLAMMA	26	2533	G2P1L1	03/09/10	10/06/11	28	243	279	TERM	2.8	NO
311	MALAR	24	2537	G2P1L1	18/10/10	25/07/11	28	359	272	TERM	2.7	NO
312	MANI	23	5651	G2P1L1	19/09/10	26/06/11	28	235	230	TERM	2.8	NO
313	SHARMILA	20	5649	PRIMI	26/11/10	03/08/11	28	248	254	TERM	2.7	NO
314	SANGAVI	19	2539	PRIMI	01/12/10	08/09/11	24	249	333	TERM	2.8	NO
315	PONNI	20	5641	PRIMI	22/03/10	29/12/10	24	256	324	TERM	2.8	NO
316	JASMINE	19	2541	PRIMI	02/05/10	09/02/11	24	284	328	TERM	2.9	NO
317	KALI	22	5639	PRIMI	13/07/10	20/04/11	28	290	318	TERM	2.9	NO
318	VANI	26	5636	G2P1L1	22/07/10	29/04/11	28	284	320	TERM	2.9	NO
319	KRISHNAVENI	23	2543	PRIMI	03/10/10	10/07/11	28	270	230	TERM	2.9	NO
320	SHANTHI	24	5632	PRIMI	11/09/10	18/06/11	28	262	265	TERM	2.7	NO
321	JANANI	22	5630	G2P1L1	22/08/10	29/05/11	28	279	238	TERM	2.8	NO

322	JAYA	21	2546	G2P1L1	18/09/10	25/06/11	28	271	201	TERM	2.7	NO
323	NASEEMA	25	5626	G2P1L1	22/07/10	29/04/11	28	263	245	TERM	2.7	YES
324	GANGA	19	2548	PRIMI	08/08/10	15/05/11	28	269	276	TERM	2.7	NO
325	RADHIKA	20	5623	PRIMI	22/09/10	29/06/11	32	318	402	TERM	2.8	NO
326	NAGALAKSHMI	21	5619	PRIMI	04/03/10	11/12/10	32	320	376	TERM	2.8	NO
327	MEENA	22	2612	PRIMI	24/06/10	01/03/11	24	238	320	TERM	2.7	NO
328	GAYATHRI	21	5723	G2P1L1	22/09/10	19/06/11	24	287	189	TERM	2.7	YES
329	REVATHI	19	5612	PRIMI	12/11/10	19/08/11	24	247	170	TERM	2.9	NO
330	RENUKA	20	1978	PRIMI	22/08/11	29/05/11	24	253	213	TERM	2.9	NO
331	KANIMOZHI	22	2614	PRIMI	01/04/10	08/01/11	24	258	219	TERM	2.7	NO
332	GOVINDHAMA	22	2617	PRIMI	04/04/10	11/01/11	24	263	228	TERM	2.8	NO
333	SULOCHANA	21	2912	PRIMI	07/05/10	12/03/11	24	269	239	TERM	2.7	NO
334	ANNALAKSHMI	24	2612	G2P1L1	19/06/10	26/03/11	28	237	254	TERM	2.7	NO
335	MANIMEGALAI	25	2889	G2P1L1	14/10/10	21/07/11	28	251	255	TERM	2.8	NO
336	SUDERGODI	26	1865	G2P1L1	13/04/10	20/01/11	24	238	263	TERM	2.8	NO
337	BABY	24	2884	PRIMI	19/08/10	26/05/11	32	300	428	TERM	2.9	NO
338	MEENAKSHI	21	2881	PRIMI	16/07/10	25/04/11	24	284	278	TERM	2.9	NO
339	SUJITHA	20	2619	G2P1L1	19/03/10	26/12/10	24	321	411	PRETER M-32 WKS	1.8	YES
340	NALINI	24	2621	G2P1L1	20/04/10	27/01/11	24	231	249	TERM	3.1	NO
341	NARMATHA	23	2871	G2P1L1	22/03/10	29/12/10	28	203	240	TERM	2.7	NO

342	JENIFER	21	2879	PRIMI	27/05/10	04/04/11	28	232	290	TERM	2.7	NO
343	SUDERKODI	20	2868	PRIMI	10/05/10	17/02/11	24	205	294	TERM	2.8	NO
344	ROHINI	19	2623	PRIMI	11/08/10	17/05/11	24	236	319	TERM	3.0	NO
345	RAMYA	23	2866	PRIMI	13/05/10	20/05/11	24	207	326	TERM	2.7	NO
346	GOMATHI	25	2625	G2P1L1	19/07/10	26/04/11	24	238	376	TERM	2.7	NO
347	AMSAVENI	23	2859	G2P1L1	20/05/10	27/02/11	32	265	398	TERM	2.9	NO
348	ANJALI	24	2627	G2P1L1	10/06/10	17/03/11	24	267	319	TERM	2.8	NO
349	AROKIYAMERI	21	2855	PRIMI	15/03/10	22/12/10	28	245	254	TERM	3.2	NO
350	YOGALAKSHMI	22	2851	PRIMI	09/05/10	16/02/11	28	279	287	TERM	2.8	NO
351	YASMIN	20	2629	PRIMI	22/04/10	29/01/11	28	238	327	TERM	2.9	NO
352	BABY	22	2850	G2P1L1	22/08/10	29/05/11	28	243	345	TERM	2.7	NO
353	MEENAKSHI	24	2844	G2P1L1	19/05/10	26/02/11	24	240	330	TERM	2.8	NO
354	POORNIMA	25	2840	G2P1L1	11/06/10	18/03/11	24	261	356	TERM	2.7	NO
355	TAMIL	19	2330	PRIMI	10/08/10	17/05/11	24	274	302	TERM	2.9	NO
356	KOKILA	20	2839	PRIMI	11/09/10	18/06/11	32	245	376	TERM	2.7	NO
357	MARY	22	2334	PRIMI	13/09/10	20/06/11	32	278	410	TERM	2.8	NO
358	MUTHULAKSHMI	21	3845	G2P1L1	21/03/10	28/12/10	24	280	249	TERM	2.9	NO
359	SRIDEVI	24	2335	G2P1L1	01/03/10	08/12/10	24	245	240	TERM	2.8	NO
360	TAMILARASI	24	2836	G2P1L1	07/08/10	14/05/11	24	325	430	PRETERM-34 WKS	2.0	YES

361	RANI	23	2338	G2P1L1	13/07/10	20/04/11	28	267	278	TERM	2.9	NO
362	MUNIYAMMAL	25	2831	PRIMI	08/04/10	15/01/11	28	259	245	TERM	2.9	NO
363	NAMITHA	21	2828	PRIMI	12/05/10	19/02/11	28	283	270	TERM	2.7	NO
364	RAGHAVI	22	2823	PRIMI	03/07/10	10/04/11	28	197	241	TERM	3.0	NO
365	SHAKILA	20	2339	G2P1L1	02/11/10	09/08/11	28	188	252	TERM	2.8	NO
366	SAMIYA	21	2821	PRIMI	08/12/10	15/09/11	28	278	266	TERM	2.9	NO
367	NISHA	24	2818	G2P1L1	04/08/10	11/05/11	28	243	270	TERM	2.7	NO
368	URMILA	23	2814	G2P1L1	03/11/10	10/08/11	24	251	284	TERM	2.7	NO
369	USHA	22	2812	PRIMI	09/03/10	15/12/10	32	336	435	TERM	2.8	NO
370	REVATHI	21	2850	PRIMI	10/09/10	17/06/11	24	284	243	TERM	2.8	NO
371	VEDHA	20	2612	G2P1L1	01/10/10	08/07/11	24	272	230	TERM	2.9	NO
372	KANNKA	24	2849	G2P1L1	21/10/10	28/07/11	24	238	239	TERM	2.7	YES
373	VELLAIYAMMA	23	2614	PRIMI	06/07/10	13/04/11	28	240	231	TERM	2.9	NO
374	KAMALAM	26	2844	PRIMI	04/08/10	11/05/11	28	257	360	TERM	2.7	NO
375	SUNDARI	21	2841	G2P1L1	08/03/10	15/12/10	28	271	357	TERM	2.8	NO
376	KAVITHA	22	2829	G2P1L1	14/04/10	21/01/11	28	284	340	TERM	2.8	NO
377	KANMANI	21	2616	G2P1L1	22/04/10	29/01/11	28	205	311	TERM	2.8	NO
378	VIJAYA	24	2826	PRIMI	15/10/10	22/07/11	24	243	354	TERM	2.7	NO
379	LAKSHMI	24	2824	PRIMI	16/09/10	23/06/11	24	284	300	TERM	2.7	NO
380	SIVAGAMI	21	2618	PRIMI	21/09/10	28/06/11	24	267	215	TERM	2.6	NO
381	VENNILA	24	2821	G2P1L1	25/09/10	02/07/11	24	262	219	TERM	2.8	NO

382	VALARMATHI	24	2818	PRIMI	06/09/10	13/06/11	24	248	234	TERM	2.6	NO
383	KANCHANA	23	2621	PRIMI	11/08/10	18/05/11	24	241	240	TERM	2.8	NO
384	SATHYA	23	2814	G2P1L1	05/03/10	11/12/10	24	234	265	TERM	2.8	NO
385	DHARANI	22	2812	G2P1L1	09/03/10	16/12/10	24	239	287	TERM	2.9	NO
386	DHANAM	24	2643	G2P1L1	11/03/10	18/12/10	24	287	290	TERM	3.0	NO
387	DHIVIYA	23	2798	G2P1L1	06/05/10	13/02/11	28	231	259	TERM	2.8	NO
388	AMSAVENI	22	2684	G2P1L1	23/08/10	30/05/11	28	187	249	TERM	2.6	NO
389	MYTHILI	21	2738	G2P1L1	16/11/10	23/08/11	28	210	327	TERM	2.8	NO
390	BHARANI	20	2731	G2P1L1	12/12/10	19/09/11	24	189	372	TERM	2.8	NO
391	AMUTHA	19	4736	PRIMI	20/04/10	27/01/11	24	193	287	TERM	2.7	YES
392	SQTHYA	21	9346	G2P1L1	13/04/10	20/01/11	32	321	423	TERM	2.8	NO
393	ANITHA	19	7234	PRIMI	03/07/10	10/04/11	28	254	240	TERM	2.9	NO
394	MALLIGA	20	5362	PRIMI	04/07/10	11/04/11	24	287	273	TERM	2.8	NO
395	GAYATHRI	22	9234	G2P1L1	18/04/10	25/01/11	24	245	348	TERM	2.9	NO
396	SAVITHA	21	9341	PRIMI	22/04/10	29/01/11	24	222	241	TERM	2.8	NO
397	ANITHA	23	8374	G2P1L1	21/05/10	28/02/11	28	269	290	TERM	2.7	NO
398	RATHA	23	4329	PRIMI	18/04/10	25/01/11	28	250	276	TERM	2.7	NO
399	RAMYA	24	3279	G2P1L1	03/04/10	10/01/11	32	309	429	TERM	3.0	NO
400	SANGEETHA	21	2767	PRIMI	20/03/10	27/12/10	24	213	365	TERM	2.7	NO