PROSPECTIVE OBSERVATIONAL STUDY TO EVALUATE THE EFFICACY OF LABETALOL VS NIFEDIPINE IN MANAGEMENT OF PRE-ECLAMPSIA. (ANTEPARTUM, INTRAPARTUM)

Dissertation submitted to

THE TAMILNADU Dr.M.G.R. MEDICAL UNIVERSITY

In partial fulfilment of the requirement
for the award of

M.S.DEGREE – OBSTETRICS & GYNECOLOGY
BRANCH - II

KILPAUK MEDICAL COLLEGE
KILPAUK, CHENNAI.

APRIL 2015.

CERTIFICATE

This is to certify that the dissertation entitled **"PROSPECTIVE OBSERVATIONAL STUDY TO EVALUATE THE EFFICACY OF LABETALOL VS NIFEDIPINE IN MANAGEMENT OF PRE-ECLAMPSIA. (ANTEPARTUM, INTRAPARTUM)"** is the bonafide original work of Dr.D.Sarulatha under the guidance of Dr.T.K.Shaanthy Gunasingh MD.,DGO., Professor of Department of Obstetrics and Gynaecology, KMCH,Chennai in partial fulfilment of the requirements for MS Obstetrics and Gynaecology branch II examination of the Tamilnadu Dr.M.G.R. Medical university to be held in April 2015 .The period of Postgraduate study and training from June 2012 to April 2015.

PROF. DR.T.K.SHAANTHY GUNASINGH.MD.DGO.,

Professor and Head

Department of Obstetrics and Gynaecology ,

Kilpauk medical college and hospital

Chennai-600010

PROR. DR.N.GUNASEKARAN,M.D.,D.T.C.D.,

The Dean

Government Kilpauk Medical College,

Chennai – 600 010.

DECLARATION

I solemnly declare that this dissertation**"PROSPECTIVE OBSERVATIONAL STUDY TO EVALUATE THE EFFICACY OF LABETALOL VS NIFEDIPINE IN MANAGEMENT OF PRE-ECLAMPSIA. (ANTEPARTUM, INTRAPARTUM)"** was prepared byme at Government Kilpauk Medical College and hospital,Chennai, under the guidance of **Dr.T.K Shaanthy Gunasingh,M.D.,D.G.O.,**Professor and Head of the Department,Department of Obstetrics and Gynaecology,Government Kilpauk Medical College and hospital,Chennai.

This dissertation is submitted to **The Tamil Nadu Dr.M.G.R. Medical University,Chennai** in partial fulfillment of the University regulations for the award of the degree of **M.S Obstetrics and Gynaecology.**

Place:

Date: (Dr. D. SARULATHA)

ACKNOWLEDGEMENT

I start this thesis in the name of Almighty God, the most beneficent and forgiving. I thank God that he has given me the privilege to learn from the able teachers in my department.

I express my sincere thanks to **PROF.Dr.N.GUNASEKARAN., M.D.,DTCD.,** Dean, Kilpauk Medical College for allowing me to conduct the study using the available facilities.

I convey my heartfelt gratitude and sincere thanks to my guide **PROF DR.T.K.SHAANTHY GUNASINGH.,MD.,DGO.,**Professor, Department of Obstetrics and Gynaecology, Kilpauk Medical College who with her exhaustive knowledge and Professional expertise has provided able guidance and constant encouragement throughout the Course of my study and in the preparation of this dissertation.

I express my sincere thanks to my professor **PROF DR.T.K.SHAANTHY GUNASINGH.,MD.,DGO.,**Professor and Head of the department of Obstetrics and Gynaecology and **Dr. SRIMATHY**, **M.D.**, **D.G.O.**, Registrar, Department of Obstetrics and Gynaecology, Kilpauk Medical College, Kilpauk, Chennai, for their valuable help and encouragement.

I am grateful to my Assistant Professors, colleagues and my friends for their advice and suggestions.

My heartful thanks to my parents and friends, who have been a constant source of encouragement and immense help, for instilling in me a sense of commitment and for their belief in me.

Last but not least I thank all **my PATIENTS**, who formed the backbone of this study without them this study would not have been possible.

INDEX

INTRODUCTION

Pregnancy induced hypertension complicates about 10% of pregnancies. Pre-eclampsia affects 3-8% of pregnancies. Pre-eclampsia is a pregnancy- specific multisystem disorder of unknown etiology, and accounts for 12-18% of maternal mortality. The incidence of eclampsia greatly varies between settings being higher in developing countries where it affects between 1/100 and 1/1700 deliveries while in industrialized/developed countries it affects about 1/2000 deliveries. Pre-eclampsia and eclampsia increase maternal and perinatal morbidity and mortality[1].

There is general consensus that maternal risk is decreased by antihypertensive treatment that lowers very high blood pressure. The control of acutely raised blood pressure has become central for women with severe hypertension, particularly that of pre-eclampsia. The aim of treatment is to quickly bring about a smooth reduction in blood pressure to levels that are safe for both mother and baby[2].

Given the recent emergence of newer or alternative first-line agent in the management of severe hypertension in pre-eclampsia and eclampsia, a study to compare the efficacy of oral nifedipine and oral labetalol is warranted. To date,

there have not been many randomized clinical trials comparing the efficacies of oral nifidipine and oral labetalol in the management of pre-eclampsia in pregnancy.

REVIEW OF LITERATURE

Hypertension is the second most common cause of maternal mortality. Pre-eclampsia is a multisystem disorder affecting every organ in the body. According to International Society for the Study of Hypertension in Pregnancy (ISSHP), hypertension is defined as systolic blood pressure of >140mm Hg or diastolic blood pressure of 90mm Hg.

A rise in the systolic blood pressure of 30 mm Hg or a rise in the diastolic blood pressure of 15mm Hg, at least 6 hours apart or a single diastolic blood pressure >110mm Hg is also considered as hypertension.

Classification of hypertensive disorders complicating pregnancy adopted by the ISSHP [international society for the study of hypertension in pregnancy] are as follows

- Gestational hypertension
- Pre-eclampsia
- Chronic hypertension
  - Essential
  - Secondary

- Pre-eclampsia superimposed on chronic hypertension.

Gestational Hypertension

New onset hypertension without proteinuria developing after 20 weeks of gestation in a previously normotensive non-proteinuric women and the blood pressure returns to normal with in a 12 weeks postpartum.

Pre-eclampsia

Hypertension associated with proteinuria >0.1g/L or more in at least 2 random urine specimens collected 6 at least hours apart or >0.3g/dl in a 24 hour collection in a previously normotensive non-proteinuric women developing after 20 weeks of gestation and returns to normal by 12 weeks postpartum.

Chronic Hypertension

Defined as hypertension developing before 20 weeks of gestation without an apparent underlying cause or secondary to renal, endocrine or vascular disorders.

Chronic Hypertension Superimposed Pre-eclampsia

New onset proteinuria in a woman with chronic hypertension after 20 weeks of gestation.

Incidence

Incidence of hypertensive disorders of pregnancy is about 15-20% of all pregnancies.

Pre-eclampsia-3%-8%

Risk Factors

- Nulliparity / primipaternity / teenage pregnancy
- Genetic predisposition
- Increased maternal age
- Multifetal gestation
- Hydatidform mole
- Triploidy

- Hydrops fetalis with large placenta.
- Pre-eclampsia in a previous pregnancy
- Chronic hypertension
- Renal disease
- Connective tissue disorders
- Obesity
- Insulin resistance
- Diabetes
- H/o thrombophilia
- Antiphospholipid syndrome
- Hyperhomocystinemia
- Sickle cell disease, sickle cell trait

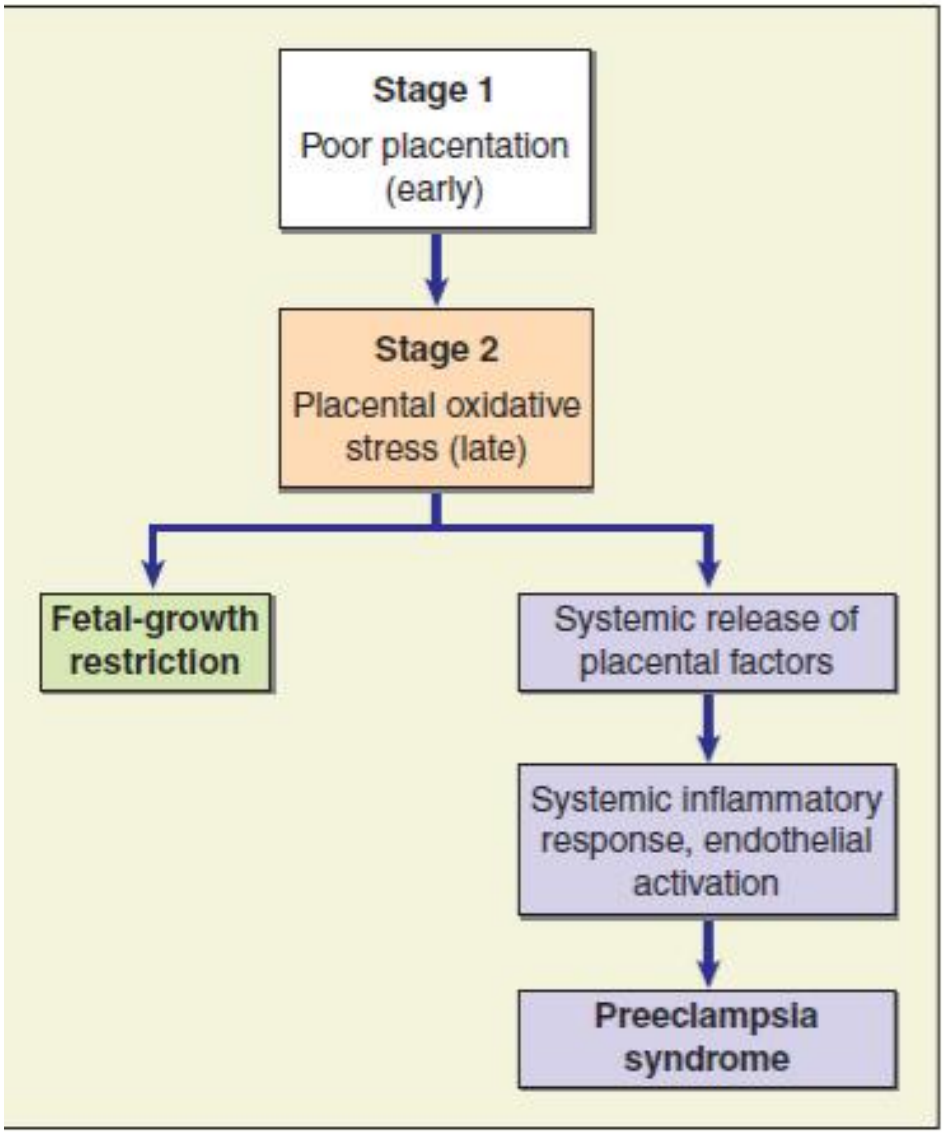
Etio-pathogenesis

Pre-eclampsia is a disease of the placenta and the fetus is not required for the development of pre-eclampsia.

The following mechanisms contribute to pathogenesis of placenta

- Shallow, endovascular cytotrophoblast invasion in the spiral arteries.
- Endothelial cell dysfunction.
- Immunological maladaptation tolerance to maternal, paternal and fetal tissues.
- Maternal maladaptation to cardiovascular or inflammatory changes of normal pregnancy
- Genetic predisposition.
- Hyperexaggerated inflammatory response.

Pre-eclampsia is a two stage disorder associated with abnormal placentation and second stage of clinical disease maternal hypertensive syndrome.



Abnormal Placentation

The embryo derived cytotrophoblasts invade the maternal uterine wall during normal placentation and the cytotrophoblasts are found in the smooth muscle and endothelial layers of maternal decidual arteries after invasion.

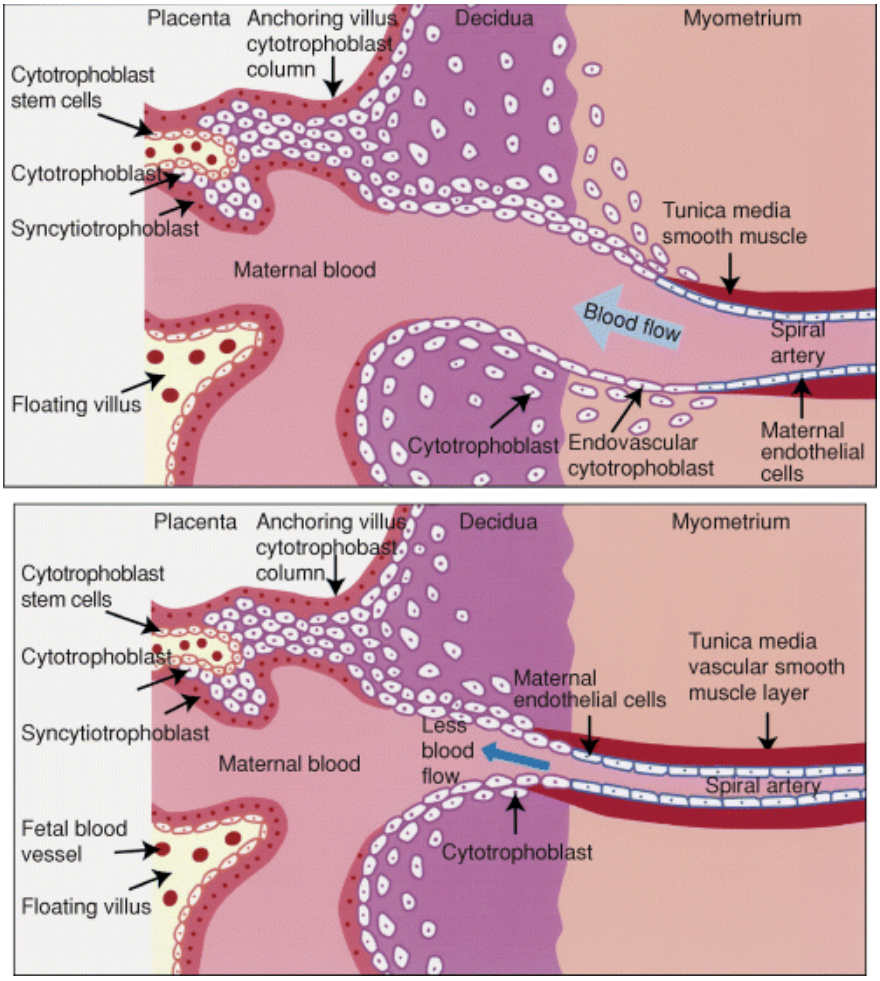
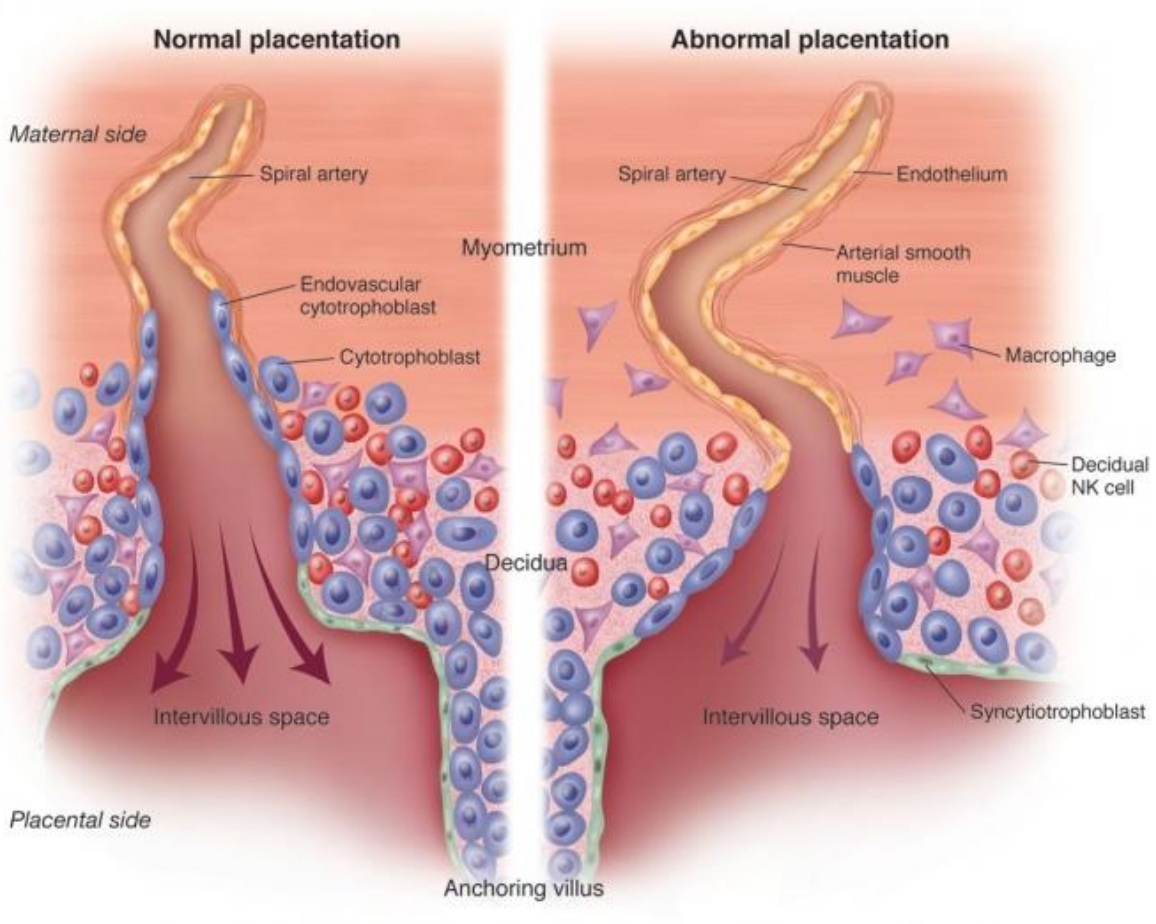


Fig. The former picture depicts normal placentation & the latter depicts abnormal placentation.

The remodelling of maternal vessels into the high capacitance and low resistance vessels which provides access for maternal oxygen and nutrients for the developing fetus and this process is demolished in pre-eclampsia.

There is incomplete invasion of the trophoblasts which results in narrow bore constricted, high resistance vessels. The shallow invasion of cytotrophoblasts may result in the failure of cytotrophoblasts to adopt an endothelial adhesion phenotype.

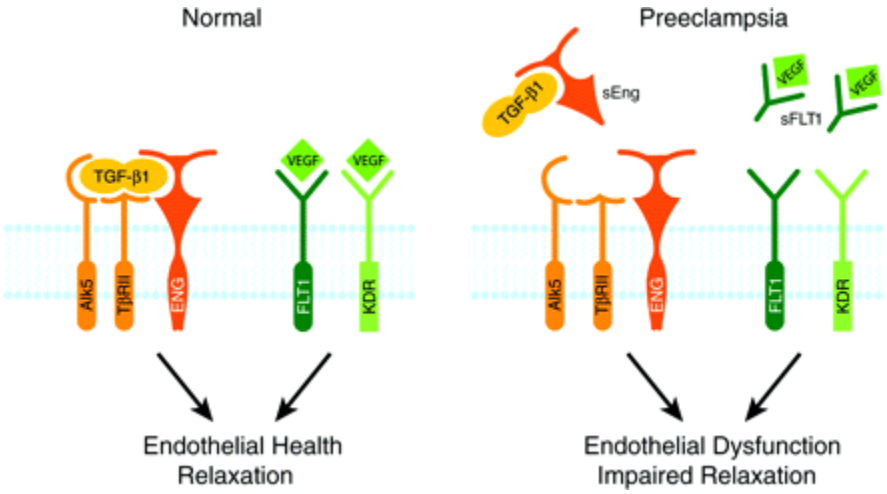


Hypoxia may also contribute to abnormal placental development because under hypoxia there is failure of invasion of trophoblasts in vitro and the hypoxia leads to release of placental debris into the maternal circulation inciting a systemic inflammatory response. So there is high risk of pre-eclampsia in women who are living at high altitude.

Endothelial cell dysfunction caused by imbalance between prostacyclin and thromboxane. Recently circulating anti-angiogenic proteins have been implicated in the pathogenesis of placenta.

Roberts and Taylor advanced the hypothesis that pre-eclampsia result from the release of circulating factors leading to widespread endothelial dysfunction. All markers of endothelial injury, fibronectin, factor 8 antigen and thrombomodulin have been reported to increase in patients with pre-eclampsia.

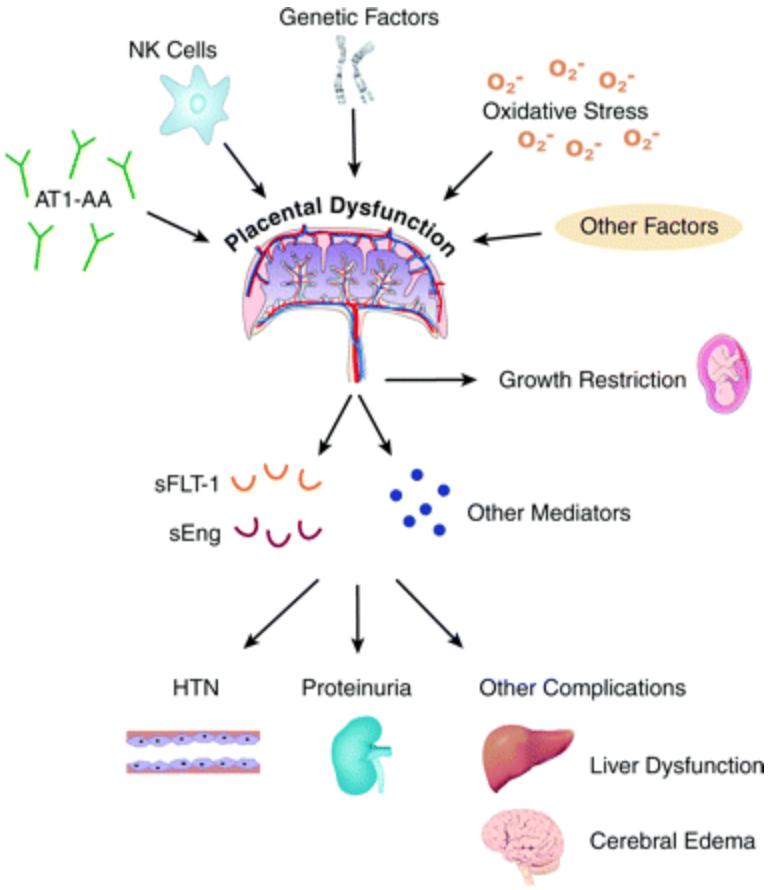
sFlt-1 (soluble fms like tyrosine kinase) is an anti-angiogenic factor is a potent inhibitor of VEGF and PIGF may play a causal role in the pathogenesis of pre-eclampsia and it is increased in placenta and blood of pre-eclampsia patients with onset before 37 weeks , severe pre-eclampsia patients, pre-eclampsia with delivery of small for gestational age.



But sFlt-1 levels were increased only within 5 weeks before the onset of hypertension and proteinuria.

Another anti-angiogenic protein sEng soluble endoglin combine with sFlt1 to induce the features of severe pre-eclampsia and it begins to rise after 20weeks of gestation and rise more steeply after 33 weeks in women of pre-eclampsia patients.

The concentration of free PIGF is reduced in pre-eclampsia and PIGF concentration begins to decrease 9-11weeks before the onset of pre-eclampsia. Other angiogenic factors like VEGF lower in severe pre-eclampsia patients. Factors like sFlk-1 (SVEGFR-2) levels found to be lower in pre-eclampsia other patients



Immunologic maldysfuncion at maternal fetal interface may contribute to pathogenesis of pre-eclampsia and the pathologic examination of pre-eclamptic patients shows increased dendritic and macrophage infiltration and signs of chronic inflammation.

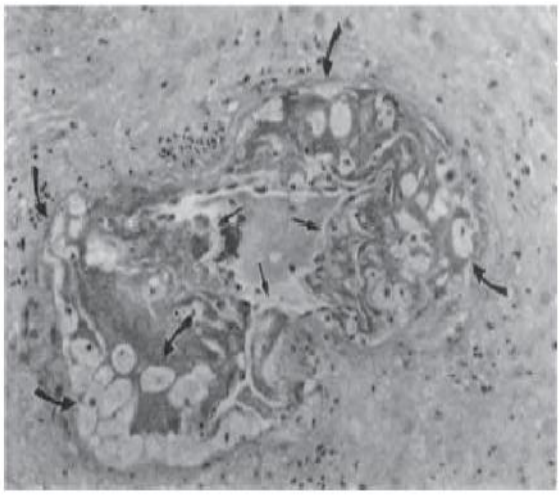
Decidual natural killer cells involved in trophoblastic invasion which promote angiogenesis may contribute to abnormal placental development in pre-eclampsia.

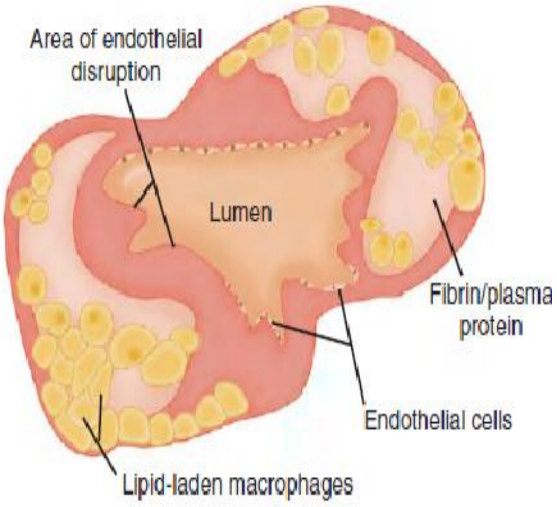
Other mechanisms like increased angiotensin sensitivity due to angiotensin receptor autoantibodies contribute to pathogenesis of pre-eclampsia. Alteration in placental enzymes like deficiency of 2-methoxyestradiol involved in pathogenesis of pre-eclampsia.

Heme oxygenase is a negative regulator of sFlt1 production elevated in smokers which reduces the risk of pre-eclampsia in sm

Placenta

Characteristic pathophysiologic change is atherosis. Characterized by fibrinoid necrosis, macrophages and mononuclear cell infiltration.





Cardiovascular System

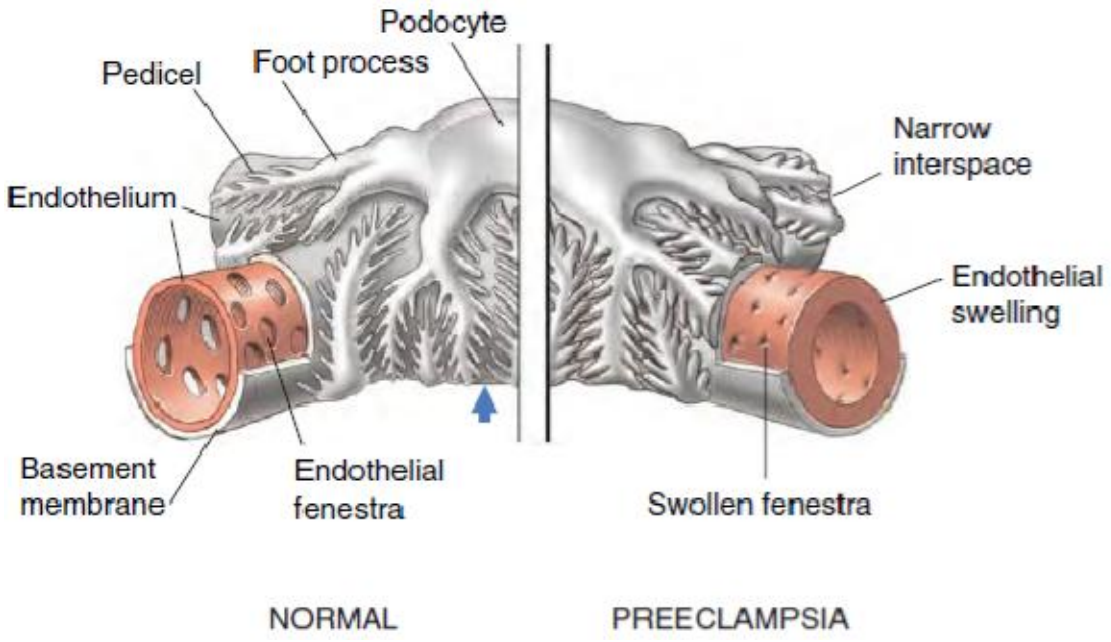
Cardiac changes in pre-eclamptic patients are increased cardiac afterload and increased cardiac preload and hemoconcentration. Hemoconcentration is due to generalised vasoconstriction that follows endothelial activation and leakage of plasma into interstitial space.

Hematology

Thrombocytopenia is most common finding and less than one lakh platelet count indicates severe disease. Severe pre-eclampsia is characterized by microangiopathic haemolytic anaemia and associated with FACTOR 8 consumption, increased levels of fibrinopeptides A and B, increased fibrin degradation products and decreased levels of antithrombin , protein C and protein S.

Kidney

Glomerular endotheliosis is the characteristic pathophysiologic change in the kidney. Glomerular endotheliosis occlude the filtration barrier due to fibrin deposition, so glomerular filtration is mildly reduced.



Main pathological change is glomerular and tubular dysfunction and responsible for proteinuria, reduction in glomerular filtration rate and creatinine clearance.

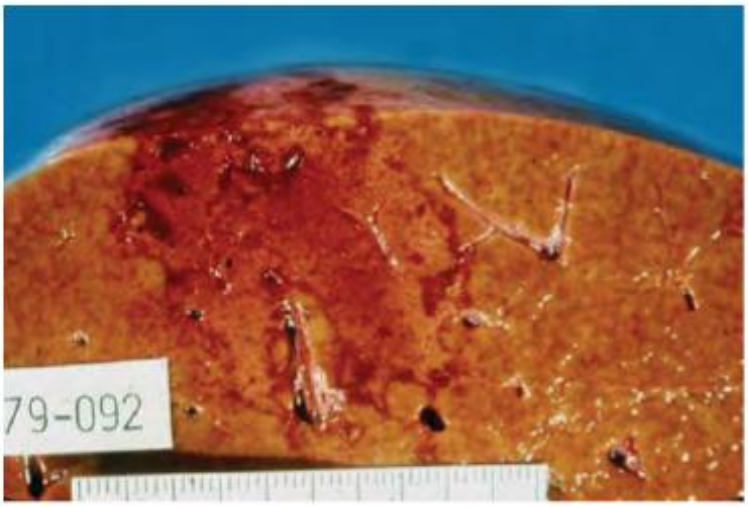
Acute renal failure rarely occurs which is caused by acute tubular necrosis.

Serum uric acid is elevated which is due to enhanced tubular reabsorption. Placental ischemia also causes hyperuricemia due to increased trophoblast turnover and production of purines

Liver

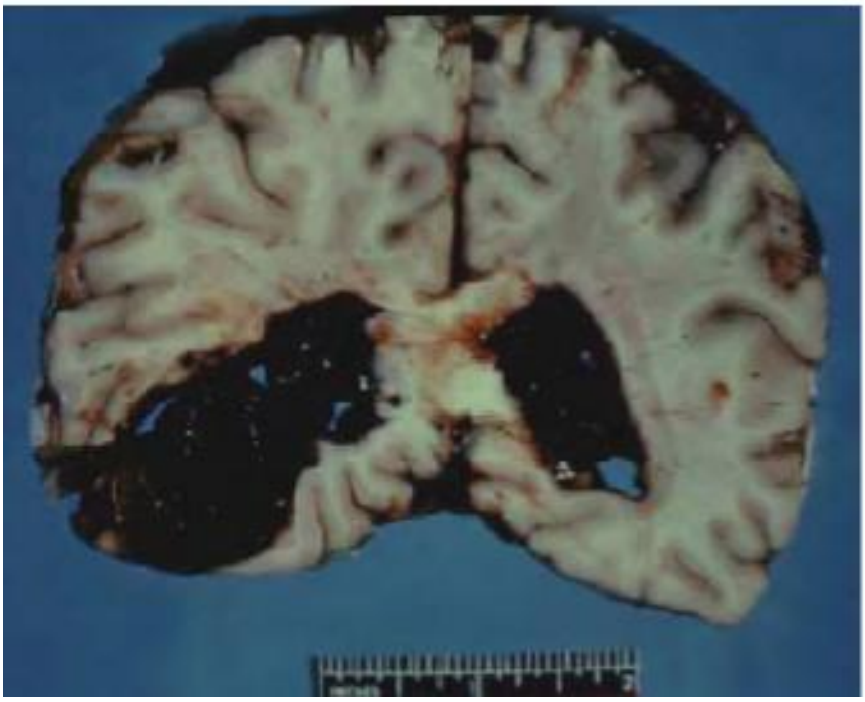
Characteristic features are periportal haemorrhage in the periphery of the liver and increase in the liver enzymes SGOT and SGPT and clinical jaundice can occur. In severe pre-eclampsia serum transaminases are elevated.

The small haemorrhages combine to form subcapsular hematoma which stretches glissons capsule responsible for epigastric pain which is a very serious sign in impending eclampsia.



Brain

Cerebral vasospasm is the main pathologic finding in brain. Cortical and subcortical petechial hemorrhages are the principal lesions.



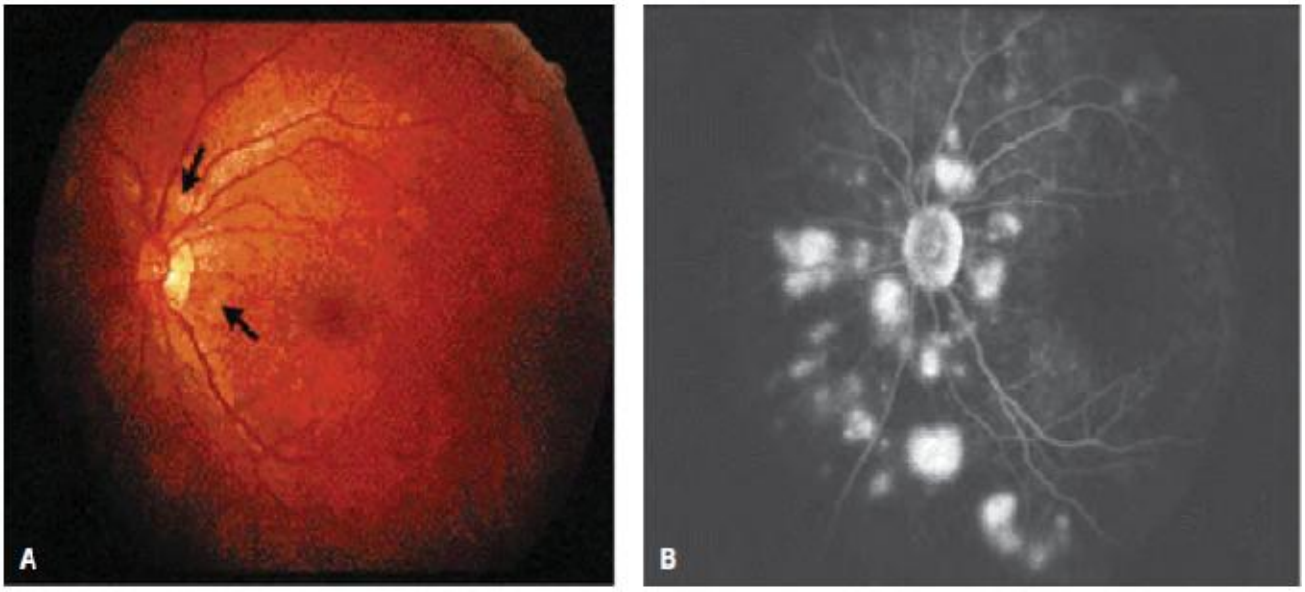
In eclampsia cerebral haemorrhages, fibrinoid necrosis and thrombi can occur and secondary to endothelial dysfunction. Cerebral edema can also occur in eclampsia and cerebral haemorrhage which is a rare complication can occur in severe pre-eclampsia.

Visual changes like scotoma, blurring of vision or diplopia will occur in severe pre-eclampia or eclampsia are due to edema of occipital lobe.

Blindness arise from three potential areas

1. Visual cortex of occipital lobe
2. Lateral geniculate nuclei
3. Retina

Purscher retinopathy resulting from blindness caused by retinal ischemia and infarction. Cortical blindness can also occur due to occipital edema.



Eyes

Commonest finding is localised retinal vasospasm and haemorrhages and papilloedema rarely seen in severe hypertension.

Complications

Pre-eclampsia is a multisystem disorder affecting every organ in the body.

Maternal

- Eclampsia
- Cerebral haemorrhage
- Cortical blindness
- Pulmonary edema
- Adult respiratory distress syndrome
- HELLP syndrome
- DIC and haemorrhage

- Acute renal failure.
- Hepatic rupture
- Abruptioplacenta and sudden postpartum collapse.
- Stroke
- Long term cardiovascular morbidity

Fetal Complications

- Preterm delivery
- Fetal growth restriction
- Intrauterine death
- Long term cardiovascular morbidity associated with low birth weight

Predictors of Pre-eclampsia

Many markers have been proposed as predictors for pre-eclampsia for early detection of high risk pregnancies to improve maternal and perinatal outcome.

- Biological, biochemical, biophysical markers of placental perfusion
- Markers of Vascular resistance
- Markers of placental - endocrine dysfunction
- Markers of oxidant stress
- Markers of endothelial dysfunction
- Markers of activated coagulation

But no single test is economical and sensitive.

1. Diastolic blood pressure prior to 20 weeks of gestation >85mmHg 93-97% specificity.
2. Mean arterial pressure

   Mean arterial pressure in the second trimester [18-26weeks] >90 mmHg is more predictor of pre-eclampsia.

   Specificity 68%

3. Gants Roll Over Test [supine pressor test]

The woman is turned from the left lateral to the supine position. If there is an increase in the diastolic blood pressure of 20mm Hg or more, the test is considered positive

4. Isometric Exercise Test [hand grip test]

Increased systolic BP >15 mm Hg

Increased diastolic BP >20mmHg

5. Angiotensin Sensitivity Test

It is based upon fact that women who destined to develop pre-eclampsia develop refractoriness between 28-32 weeks of gestation

If pressor response occurs with <8ng/kg/min of infused angiotensin, 90% of the patients likely to develop pre-eclampsia. But this test is invasive.

6. Uterine Artery Doppler

Normally in the non-pregnant state diastolic flow is decreased and notching of uterine arteries. In normal pregnancy diastolic notch disappears and flow increases due to trophoblastic invasion.

In pre-eclampsia second wave of trophoblastic invasion has not occurred and there is persistent of diastolic notch in the uterine artery at 20-

22weeks of gestation which is predictive of pre-eclampsia. Disappearance of the notch is more likely to predict that the pregnancy is normal.

7. PULSE WAVE ANALYSIS

Stiffness in the finger arterial pulse acts as a predictor.

8. Raised serum BETA HCG at 14-20 weeks of gestation

Beta HCG is increased due to abnormal trophoblastic invasion. It is also increased due to placental dysmaturity. Increased production by hypoxic trophoblasts.

9. Tests related to feto placental unit endocrine dysfunction

- Alpha feto protein
- Estriol levels
- Inhibin levels
- Pregnancy associated plasma proteins
- Activin level
- Placental protein 13
- Corticotrophin releasing hormone

Other markers are

- Platelet count
- Sflt-1 fms like tyrosine kinase receptor

- Endoglin
- Plasminogen activator inhibitor
- Neurokinin bp selectin
- Decreased levels of proangiogenic factors like vascular endothelial factor, placental growth factor, endothelial adhesion molecules

10. Dyslipidemia is also predictor of pre-eclampsia

Lipid markers are triglycerides, free fatty acids and lipoproteins are predictors of pre-eclampsia.

11. Serum uric acid

Placenta

- Inhibition of nitric oxide production
- Decreased invasion of trophoblasts and remodelling
- Endothelial cell dysfunction
- Smooth muscle proliferation
- Compromises placental perfusion
- Oxidative stress and inflammation

Maternal Vasculature

- Smooth muscle cell proliferation
- Endothelial cell dysfunction
- Activates inflammation
- Oxidative stress
- Inhibition of endothelial nitric oxide production

Management of Pre-eclampsia

Hypertension complicating pregnancy is managed according to severity, gestational age and associated pre-eclampsia. The main objective of treating pre-eclampsia is to prevent maternal and fetal morbidity and mortality.

Management of Mild Pre-eclampsia

Mild pre-eclampsia can be managed on outpatient basis with the help of day care units. Effective monitoring of mother and fetus is essential. Patient should visit hospital at least once weekly after the diagnosis of pre-eclampsia.

All parameters should be evaluated if they are normal patient can be managed on an outpatient basis. No role of diuretics in the management of pre-eclampsia except when pre-eclampsia associated with pulmonary edema.

The use of antihypertensive drugs in mild pre-eclampsia remains questionable. The main objective of treatment with anti-hypertensive is to reduce the risk of severe hypertension, eclampsia and cerebrovascular haemorrhage.

There is loss of cerebral auto-regulation and risk of cerebral haemorrhage once the mean arterial blood pressure reaches 150mmHg.

The first lines of drugs are

- Labetalol
- Nifedipine
- Alpha-Methyl Dopa

Maternal Monitoring

- Daily urine albumin
- Blood pressure daily
- Daily weight

- History of imminent symptoms
- Lab tests like platelet count, liver and renal function tests, serum uric acid twice weekly
- Coagulation profile

Fetal Monitoring

- Fetal kick count daily
- NST and amniotic fluid index twice weekly
- Ultrasound to assess gestational age and growth
- Umbilical Artery Doppler.

The only definitive treatment for pre-eclampsia is delivery. Patients with mild pre-eclampsia can be induced at 38 weeks of gestation.

Pregnancy should be terminated earlier if there is progression of mild to severe pre-eclampsia or imminent eclampsia or eclampsia and for obstetric indications like IUGR. If pregnancy is terminated before 34 weeks corticosteroids are given for lung maturity and to prevent respiratory distress syndrome.

Labour can be induced vaginally if there are no obstetric indications for caesarean section. If the cervix is unfavourable induce with dinoprostone gel

vaginally and artificial rupture of membranes, oxytocin acceleration if the cervix is favourable. During labour continuous blood pressure monitoring, CTG monitoring and active management of third stage of labour is followed.

Severe Pre-eclampsia

Criteria for severe pre-eclampsia

- Systolic blood pressure of >160mmHg or diastolic blood pressure of 110mmHg on at least two occasions 6 hours apart
- 5g proteinuria or higher in a 24 hour urinary specimen
- Oliguria
- Pulmonary edema
- Visual disturbances
- Epigastric pain
- Thrombocytopenia
- Elevated liver enzymes
- Fetal growth restriction

Since there is deterioration of maternal or fetal condition the only definitive treatment is delivery. Severe pre-eclampsia >34 weeks is terminated if there is

worsening of biochemical parameters. Less than 24 weeks also best managed by termination whereas onset of severe pre-eclampsia <34 weeks but greater than 28 weeks there is role of expectant management for the sake of the fetus.

Management

- Admit to the labour ward.
- Complete maternal and fetal evaluation within 24 hours.
- Start anti-hypertensives if systolic BP > 160 or diastolic BP > 110 to prevent cerebral haemorrhage.
- Use prophylactic magnesium sulphate regimen is used to prevent or reduce complications and rate of seizures.
- Inject steroids to help speed the infant's lung maturity.
- Terminate pregnancy immediately if there is deterioration of maternal or fetal condition or developing complications like eclampsia, pulmonary oedema, abruption placentae, disseminated intravascular coagulation (DIC), acute renal failure, HELLP syndrome, non-reassuring fetal status pregnancy is immediately terminated.

Intrapartum Management

- Close monitoring of blood pressure is necessary. IV labetolol can be used for high blood pressure.
- Rapid fall in blood pressure is detrimental to both mother and fetus, so close monitoring is needed.
- Continue to use magnesium sulphate to prevent convulsions.
- Avoid fluid overload as pre-eclamptic patients are prone for pulmonary oedema.
- Transfuse fresh frozen plasma or blood products if there is DIVC.
- Indicate caesarean section if there is worsening of maternal condition, non-reassuring fetal pattern, failed induction or other associated obstetric indications.

Preventive Measures

- ❖ No role of sodium restriction in the prevention of pre-eclampsia and salt restriction is not recommended.
- ❖ Antioxidants also not recommended.
- ❖ No role of diuretics in the prevention.

- According to some studies supplementation of low dose aspirin found to reduce the incidence of IUGR and preterm labour,19% reduction in risk of preeclampsia,16%reduction in risk of fetal or neonatal deaths.
- Low calcium intake increases blood pressure by stimulating release of parathyroid hormone which increases intracellular calcium in vascular smooth muscle and vasoconstriction and extracellular ionized calcium is necessary for the production of nitric oxide and regulation of vascular tone, hence calcium supplementation found to reduce the risk of preeclampsia in high risk population and in women with low intake of dietary calcium.
- No randomized trials for heparin or low molecular weight heparin, hence not recommended.

Nifedipine:

Dihydropyridine calcium channel blocker that primarily block L- type calcium channels[3].

Pharmacokinetics:

Rapid onset of action,

Good oral bioavailability,

Infrequent side effects.

Dosage:

Starting dose – 10mg, taken 3 times daily

Extended release – Starting dosage 30mg to 60mg, taken once daily.

Onset of action:

Within 20 minutes.

Duration of action:

4-8 hours with half- life of 2 hours.

Previous investigations have demonstrated that nifedipine effectively lowers blood pressure without any apparent reduction in utero-placental blood flow and without any significant fetal heart rate abnormalities[4].

Labetalol:

Competitive antagonist at both alpha1 and beta receptors. Alpha1 receptor blocker leads to arterial vasodilatation and blocking of reflex sympathetic stimulation of the heart. In addition, the intrinsic sympathomimetic activity of labetalol at beta2 receptors may contribute to vasodilation.

Available dosage:

100mg tablets and intravenously in 5mg/ml solution.

Starting dosage:

Taken 100mg twice daily, with a maximum of 2.4g/day. Intravenous doses started at 20mg over two minutes .Additional 80mg doses can be given to a total maximum dose of 300mg.Administered by IV infusion at a rate of 2mg/minute with a maximum dose of 300mg.

Onset of action:

Begins within 20-30 min. on taken orally, 2-5 minutes after IV administration , reaching its peak at 5-15 minutes and lasting 2-4 hours.

Heart rate is either maintained or slightly reduced and cardiac output is maintained. Labetalol reduces systemic vascular resistance without reducing total peripheral blood flow. Cerebral, renal, coronary blood flow is maintained. It has little placental transfer due to the poor lipid solubility[5].

AIM AND OBJECTIVES:

AIM:

To study the efficacy of oral labetalol vs. oral nifedipine in the management of Pre-eclampsia in Ante-partum and Intra-partum period.

OBJECTIVES:

Primary Objective:

To study the efficacy of oral labetalol vs. oral nifedipine in management of Pre-eclampsia.

Secondary Objective:

To confirm the results with clinical parameters and maternal and fetal outcome.

MATERIALS & METHODS:

Study Design

Prospective observational study.

Study place

Antenatal ward and Labor ward

Study Period

The study was carried over a period of 12 months from October 2013 to September 2014.

Inclusion Criteria

All Antenatal women diagnosed to have Pre-eclampsia, irrespective of gestation,

Exclusion Criteria

k/c of Bronchial asthma, Diabetes, Thyroid disorder

k/c of Heart diseases.

Sample Size

Total of 150 antenatal patients, with 75 patients in each group.

Group 1: Labetalol

Group 2: Nifedipine

METHODOLOGY:

All pregnant women irrespective of gestation diagnosed as pre-eclampsia by clinical parameter are subjected to pharmacological therapy. A total of 150 antenatal patients who attended the antenatal clinic and labour ward of the Department of Obstetrics and Gynaecology, Government Kilpauk Medical College, were selected based on inclusion and exclusion criteria after obtaining their consent.

All selected women were subjected to a detailed history comprising of age, parity, body weight and height, LMP, medical history, drug history, previous obstetric history, previous H/o pre-eclampsia.

They were subjected to clinical examination and BP was recorded. Routine laboratory investigations were done.

These patients were regularly followed up in the antenatal OP once in 4 weeks till 28 weeks then once in two weeks till their delivery and thorough clinical examination were done focusing their blood pressure and urine albumin. All details were entered.

Definitions used for the diagnosis of pre-eclampsia was according to International Society for the Study of Hypertension in Pregnancy [ISSHP], hypertension is defined as systolic blood pressure of > 140 or diastolic blood pressure of > 90mmHg.

A rise in the systolic blood pressure of 30mmHg or rise in the diastolic blood pressure of 15mmHg, at least 4 hours apart associated with proteinuria of at least 1+ or 1g/L on dipstick.

Case Report:

Group 1(Labetalol)

Case 1: Dhanalakshmi 26/f,

IP.NO. 1423412,

Residence: villivakkam,Chennai.

G2P2L1(Obstetric score –2)

Patient referred to KMC, as pre-eclampsia for further management.

GA: 37 Weeks

Admission BP: 160/110mm Hg.

Mean BP: 126mmHg

Proteinuria Grade before staring drug therapy: 1 (4 plus)

Pre-eclampsia grading: 2(severe)

Drug Therapy: T. Labetalol 100mg twice daily started.

1st Follow-up visit at 6 hours,

BP:140/90mmHg, with mean BP: 106mmHg

2nd Follow-up visit at 24hours,

BP:130/90mmHg, with mean BP: 103mmHg

Proteinuria Grade after drug therapy – 1

Maternal Outcome –2(LSCS)

Fetal Outcome – 1(Live birth), 1min.APGAR -6, 5min.APGAR – 7, with baby admitted in NICU, with birth weight of 2.5kg.

Case 2: Sandhiya 19/f,

IP.NO. 1423169,

Residence: chetpat,Chennai.

G1P1(Obstetric score –1)

GA: 37 Weeks

Admission BP: 160/110mm Hg.

Mean BP: 126mmHg

Proteinuria Grade before staring drug therapy: 1 (4 plus)

Pre-eclampsia grading: 2(severe)

Drug Therapy: T. Labetalol 100mg twice daily started.

1st Follow-up visit at 6 hours,

BP:150/90mmHg, with mean BP: 110mmHg

2nd Follow-up visit at 24hours,

BP:140/80mmHg, with mean BP: 100mmHg

Proteinuria Grade after drug therapy – 1

Maternal Outcome –2(LSCS)

Fetal Outcome – 1(Live birth), 1min.APGAR -7, 5min.APGAR – 8, with baby admitted in NICU, with birth weight of 2.2kg.

Case 3: Priya 22/f,

IP.NO. 1423578,

Residence: kilpauk,Chennai.

G2P2L1(Obstetric score –2)

Patient referred to KMC, as pre-eclampsia for further management.

GA: 37 Weeks

Admission BP: 140/90mm Hg.

Mean BP: 106mmHg

Proteinuria Grade before staring drug therapy: 3 (2 plus)

Pre-eclampsia grading: 1(mild)

Drug Therapy: T. Labetalol 100mg twice daily started.

1st Follow-up visit at 6 hours,

BP:130/80mmHg, with mean BP: 96mmHg

2nd Follow-up visit at 24hours,

BP:130/80mmHg, with mean BP: 96mmHg

Proteinuria Grade after drug therapy – 3

Maternal Outcome –1(normal delivery)

Fetal Outcome – 1(Live birth), 1min.APGAR -7, 5min.APGAR – 8, with birth weight of 2.7kg.

Case 4: Adhista lakshmi 28/f,

IP.NO. 1423576,

Residence: Kilpauk,Chennai.

G2P2L1(Obstetric score –2)

GA: 35 Weeks

Admission BP: 170/110mm Hg.

Mean BP: 130mmHg

Proteinuria Grade before staring drug therapy: 1 (4 plus)

Pre-eclampsia grading: 2(severe)

Drug Therapy: T. Labetalol 100mg twice daily started.

1st Follow-up visit at 6 hours,

BP:150/90mmHg, with mean BP: 110mmHg

2nd Follow-up visit at 24hours,

BP:140/90mmHg, with mean BP: 106mmHg

Proteinuria Grade after drug therapy – 1

Maternal Outcome –2(LSCS)

Fetal Outcome – 1(Live birth), 1min.APGAR -6, 5min.APGAR – 7, with baby admitted in NICU, with birth weight of 1.75kg.

Case 5: Bhanumathi 34/f,

IP.NO. 1423898,

Residence: villivakkam,Chennai.

G1P2(Obstetric score –1)

GA: 38 Weeks

Admission BP: 140/90mm Hg.

Mean BP: 106mmHg

Proteinuria Grade before staring drug therapy: 3 (2 plus)

Pre-eclampsia grading: 1(mild)

Drug Therapy: T. Labetalol 100mg twice daily started.

1st Follow-up visit at 6 hours,

BP:120/90mmHg, with mean BP: 100mmHg

2nd Follow-up visit at 24hours,

BP:120/80mmHg, with mean BP: 93mmHg

Proteinuria Grade after drug therapy – 3

Maternal Outcome –2(LSCS)

Fetal Outcome – 1(Live birth), 1min.APGAR -6, 5min.APGAR – 7, with birth weight of 2.5kg.

Group 2:(Nifedipine)

Case 1: Bakiyalakshmi 22/f,

IP.NO. 1421623,

Residence: Shenoy nagar,Chennai.

G1P1(Obstetric score –1)

GA: 37 Weeks

Admission BP: 140/90mm Hg.

Mean BP: 106mmHg

Proteinuria Grade before staring drug therapy: 3 (2 plus)

Pre-eclampsia grading: 1(mild)

Drug Therapy: T. Nifedipine 10mg thrice daily started.

1st Follow-up visit at 6 hours,

BP:120/70mmHg, with mean BP: 86mmHg

2nd Follow-up visit at 24hours,

BP:120/80mmHg, with mean BP: 93mmHg

Proteinuria Grade after drug therapy – 3

Maternal Outcome –2(LSCS)

Fetal Outcome – 1(Live birth), 1min.APGAR -7, 5min.APGAR – 8, with birth weight of 2.8kg.

Case 2: Senbegam 23/f,

IP.NO. 1421248,

Residence: Nungambakam,Chennai.

G2P2L1(Obstetric score –2)

GA: 38 Weeks

Admission BP: 150/90mm Hg.

Mean BP: 116mmHg

Proteinuria Grade before staring drug therapy: 2 (3 plus)

Pre-eclampsia grading: 1(mild)

Drug Therapy: T. Nifedipine 10mg thrice daily started.

1st Follow-up visit at 6 hours,

BP:140/90mmHg, with mean BP: 106mmHg

2nd Follow-up visit at 24hours,

BP:130/80mmHg, with mean BP: 96mmHg

Proteinuria Grade after drug therapy – 2

Maternal Outcome –1(Normal delivery)

Fetal Outcome – 1(Live birth), 1min.APGAR -8, 5min.APGAR – 9, with birth weight of 3kg.

Case 3: Ranjini 23/f,

IP.NO. 1421146,

Residence: Anna nagar east,Chennai.

G1P1(Obstetric score –1)

GA: 37 Weeks

Admission BP: 140/90mm Hg.

Mean BP: 106mmHg

Proteinuria Grade before staring drug therapy: 3 (2 plus)

Pre-eclampsia grading: 1(mild)

Drug Therapy: T. Nifedipine 10mg thrice daily started.

1st Follow-up visit at 6 hours,

BP:120/80mmHg, with mean BP: 93mmHg

2nd Follow-up visit at 24hours,

BP:130/80mmHg, with mean BP: 96mmHg

Proteinuria Grade after drug therapy – 3

Maternal Outcome –2(LSCS)

Fetal Outcome – 1(Live birth), 1min.APGAR -7, 5min.APGAR – 8, with birth weight of 2.7kg.

Case 4: Tajunisa 24/f,

IP.NO. 1420838,

Residence: Purasaiwakkam,Chennai.

G1P1(Obstetric score –1)

GA: 35 Weeks

Admission BP: 160/110mm Hg.

Mean BP: 126mmHg

Proteinuria Grade before staring drug therapy: 1 (4 plus)

Pre-eclampsia grading: 2(severe)

Drug Therapy: T. Nifedipine 10mg thrice daily started.

1st Follow-up visit at 6 hours,

BP:140/90mmHg, with mean BP: 106mmHg

2nd Follow-up visit at 24hours,

BP:130/90mmHg, with mean BP: 103mmHg

Proteinuria Grade after drug therapy – 1

Maternal Outcome –1(Normal delivery)

Fetal Outcome – 1(Live birth), 1min.APGAR -7, 5min.APGAR – 8,with baby admitted in NICU, with birth weight of 1.8kg.

Case 5: Anitha 19/f,

IP.NO. 1420771,

Residence: Kilpauk,Chennai.

G1P1(Obstetric score –1)

GA: 34 Weeks

Admission BP: 170/110mm Hg.

Mean BP: 130mmHg

Proteinuria Grade before staring drug therapy: 1 (4 plus)

Pre-eclampsia grading: 2(severe)

Drug Therapy: T. Nifedipine 10mg thrice daily started.

1st Follow-up visit at 6 hours,

BP:150/90mmHg, with mean BP: 110mmHg

2nd Follow-up visit at 24hours,

BP:140/90mmHg, with mean BP: 106mmHg

Proteinuria Grade after drug therapy – 1

Maternal Outcome –1(Normal delivery)

Fetal Outcome – 1(Live birth), 1min.APGAR -7, 5min.APGAR – 8,with baby admitted in NICU, with birth weight of 1.6kg.

Results of the Study:

- The patients who had diagnosed to have pre-eclampsia were divided into two groups, Group 1& 2 randomly.
- The factors taken for analysis were age group, pre-treatment blood pressure measurement, proteinuria measurement, maternal outcome, fetal outcome, APGAR measurement, NICU admission, birth weight and obstetric score.
- Group 1 patients were subjected to drug therapy with Tab.Labetalol 100mg twice daily, followed after 6 hours and after 24 hours, and the results were statistically compared.
- Group 2 patients were subjected to drug therapy with Tab.Nifedipine 10mg thrice daily, followed after 6 hours and after 24 hours, and the results were statistically compared.
- Efficacy of both drugs in controlling blood pressure compared statistically.
- Maternal and Fetal outcomes with each drug therapy were statistically compared.

Statistical Analysis

AGE GROUP * GROUP

Group 1-- < 20 years

Group 2 –20- 25 years

Group 3 – 26-30 years

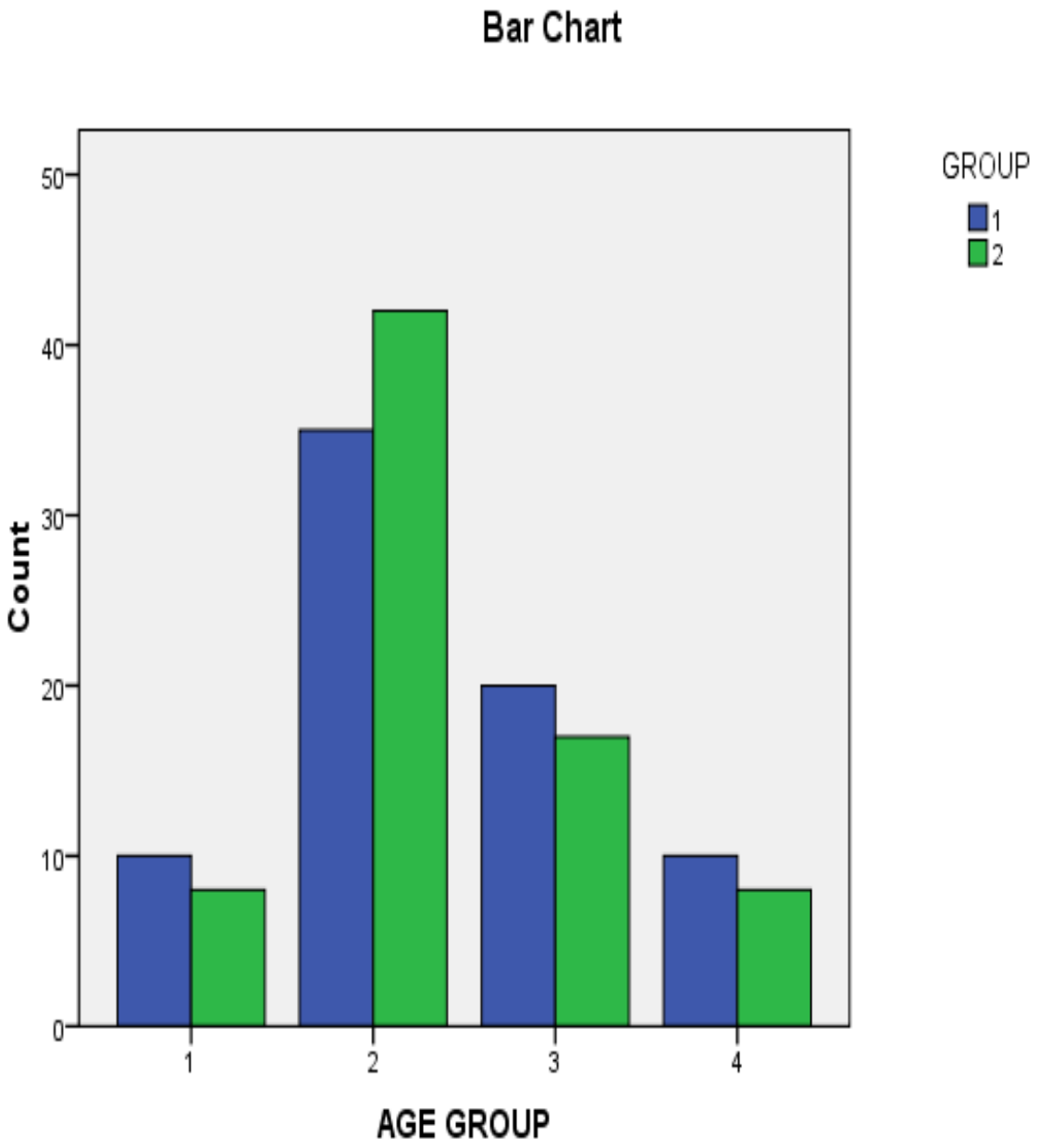
Group 4 -- >30 years

Crosstab

			GROUP		
			1	2	Total
AGE GROUP	1	**COUNT**	10	8	18
		% WITHIN GROUP	13.3%	10.7%	12.0%
	2	**COUNT**	35	42	77
		% WITHIN GROUP	46.7%	56.0%	51.3%
	3	**COUNT**	20	17	37
		% WITHIN GROUP	26.7%	22.7%	24.7%
	4	**COUNT**	10	8	18
		% WITHIN GROUP	13.3%	10.7%	12.0%
	Total	**COUNT**	75	75	150
		% within GROUP	100.0%	100.0%	100.0%

Chi square= 1.324 p=0.723 not significant.

Bar chart depicting Age group comparision between two groups



PRE_PROTEINURIA G * GROUP

Pre-Proteinuria 1 – 4 plus

Pre-Proteinuria 2 – 3 plus

Pre-Proteinuria 3 – 2 plus

Pre-Proteinuria 4 – 1 plus

Pre-Proteinuria 5 – Trace

Crosstab

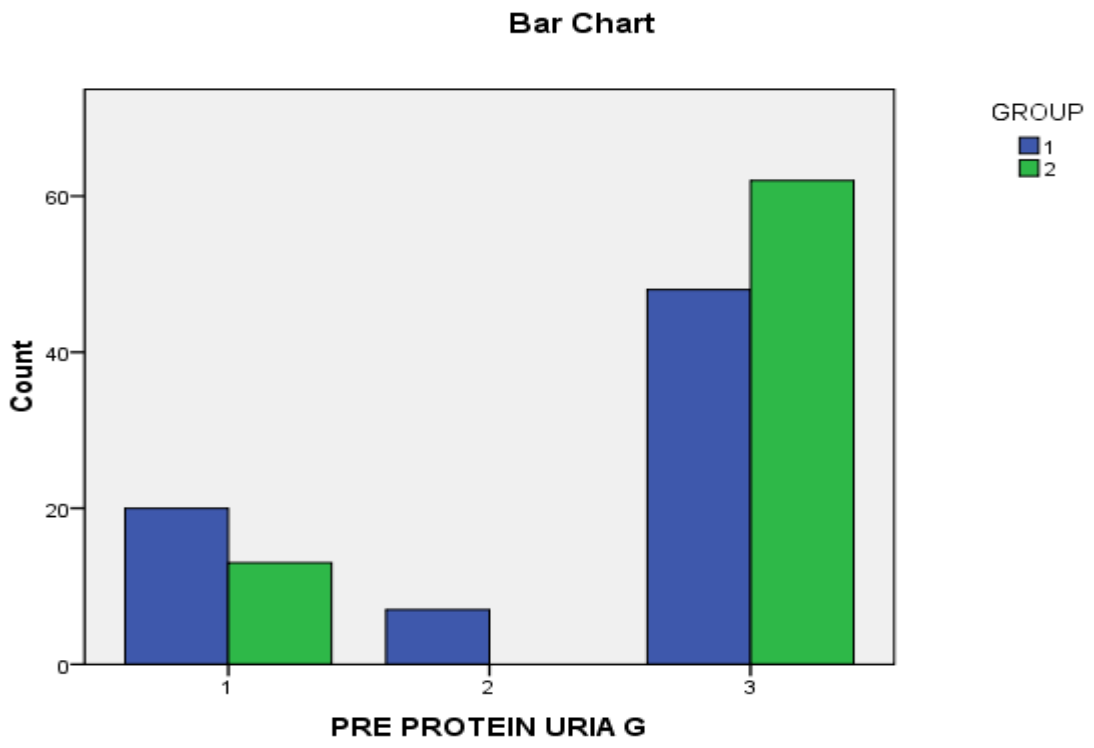
			GROUP		
			1	2	Total
PRE PROTEINURIA G	1	**COUNT**	20	13	33
		% WITHIN GROUP	26.7%	17.3%	22.0%
	2	**COUNT**	7	0	7
		% WITHIN GROUP	9.3%	.0%	4.7%
	3	**COUNT**	48	62	110
		% WITHIN GROUP	64.0%	82.7%	73.3%
	Total	**COUNT**	75	75	150
		% WITHIN GROUP	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.267[a]	2	.006
Likelihood Ratio	12.987	2	.002
Linear-by-Linear Association	4.234	1	.040
N of Valid Cases	150		

2 cells (33.3%) have expected count less than 5. The minimum expected count is 3.50.

Bar chart depicting pre-proteinuria levels in two groups.



PRE ECLAMSIA * GROUP

Pre-eclampsia 1 – Mild 140/90 mmhg

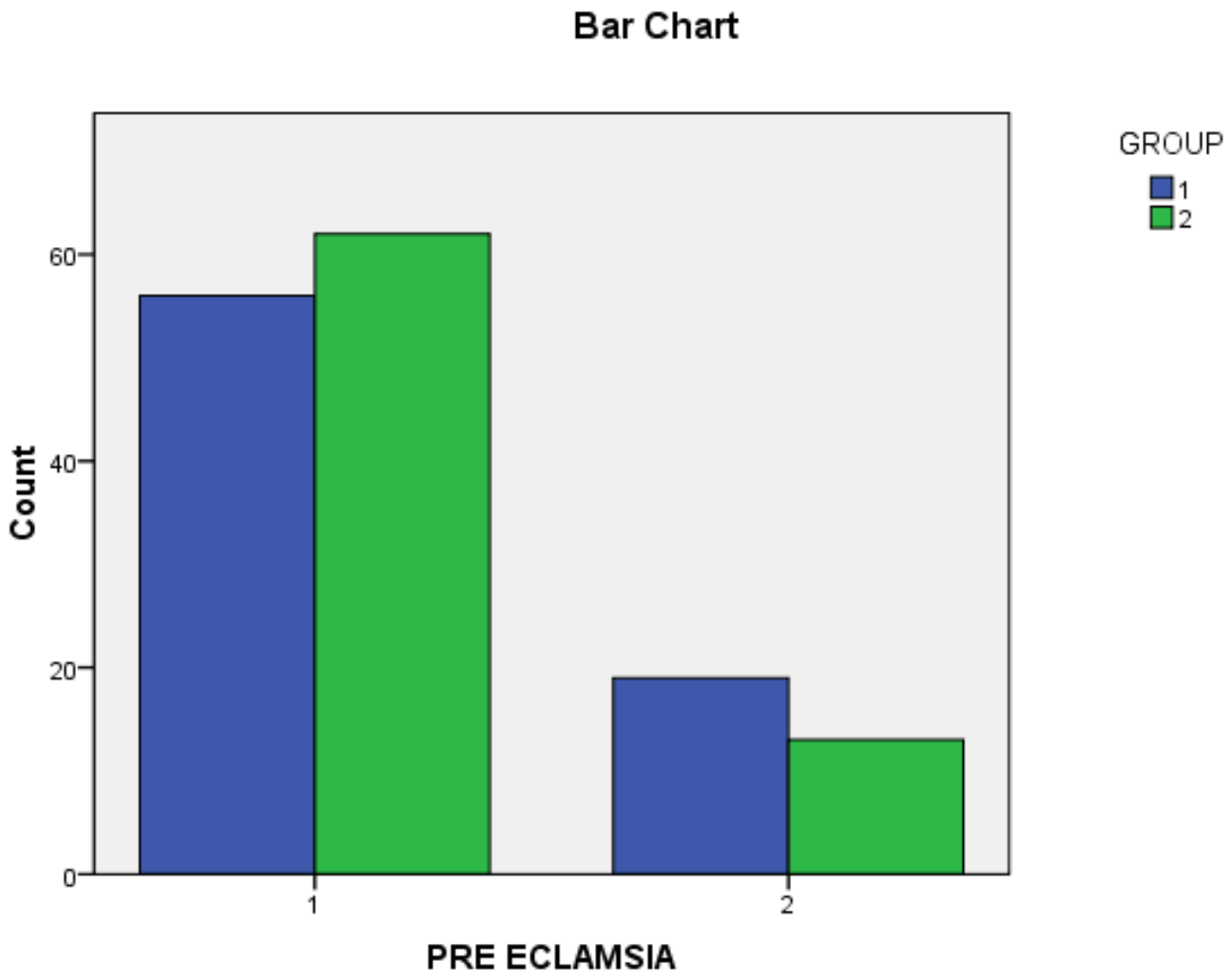
Pre-eclampsia 2 – Severe >160/110 mmhg

Crosstab

			GROUP		
			1	2	Total
PRE ECLAMSIA	1	**COUNT**	56	62	118
		% WITHIN GROUP	74.7%	82.7%	78.7%
	2	**COUNT**	19	13	32
		% WITHIN GROUP	25.3%	17.3%	21.3%
	Total	**COUNT**	75	75	150
		% WITHIN GROUP	100.0%	100.0%	100.0%

Chi square =1.430 p=0.232 not significant

Bar chart depicting pre-eclampsia in two groups.



POST PROTEINURIA(PU) * GROUP

Crosstab

			GROUP		
			1	2	Total
POST PU	1	**COUNT**	20	13	33
		% WITHIN GROUP	26.7%	17.3%	22.0%
	2	**COUNT**	5	0	5
		% WITHIN GROUP	6.7%	.0%	3.3%
	3	**COUNT**	50	62	112
		% WITHIN GROUP	66.7%	82.7%	74.7%
	Total	**COUNT**	75	75	150
		% WITHIN GROUP	100.0%	100.0%	100.0%

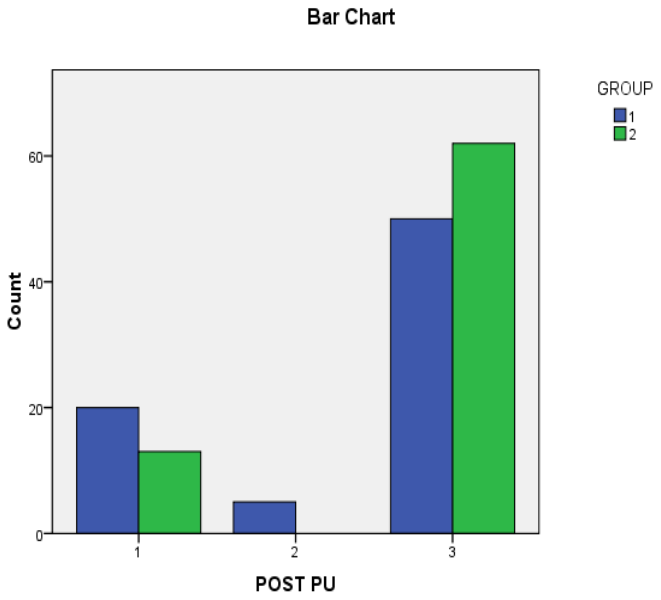
Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.771[a]	2	.021

Likelihood Ratio	9.716	2	.008
Linear-by-Linear Association	3.468	1	.063
N of Valid Cases	150		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 2.50.

Bar chart depicting post-proteinuria levels in two groups.



POST PU * GROUP

Crosstab

		GROUP		
		1	2	Total
0	**COUNT**	3	0	3
	% WITHIN GROUP	4.0%	.0%	2.0%
1	**COUNT**	72	75	147
	% WITHIN GROUP	96.0%	100.0%	98.0%
Total	Count	75	75	150
% within GROUP	100.0%	100.0%		100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.061[a]	1	.080		
Continuity Correction[b]	1.361	1	.243		
Likelihood Ratio	4.220	1	.040		
Fisher's Exact Test				.245	.122
Linear-by-Linear Association	3.041	1	.081		
N of Valid Cases	150				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.50.

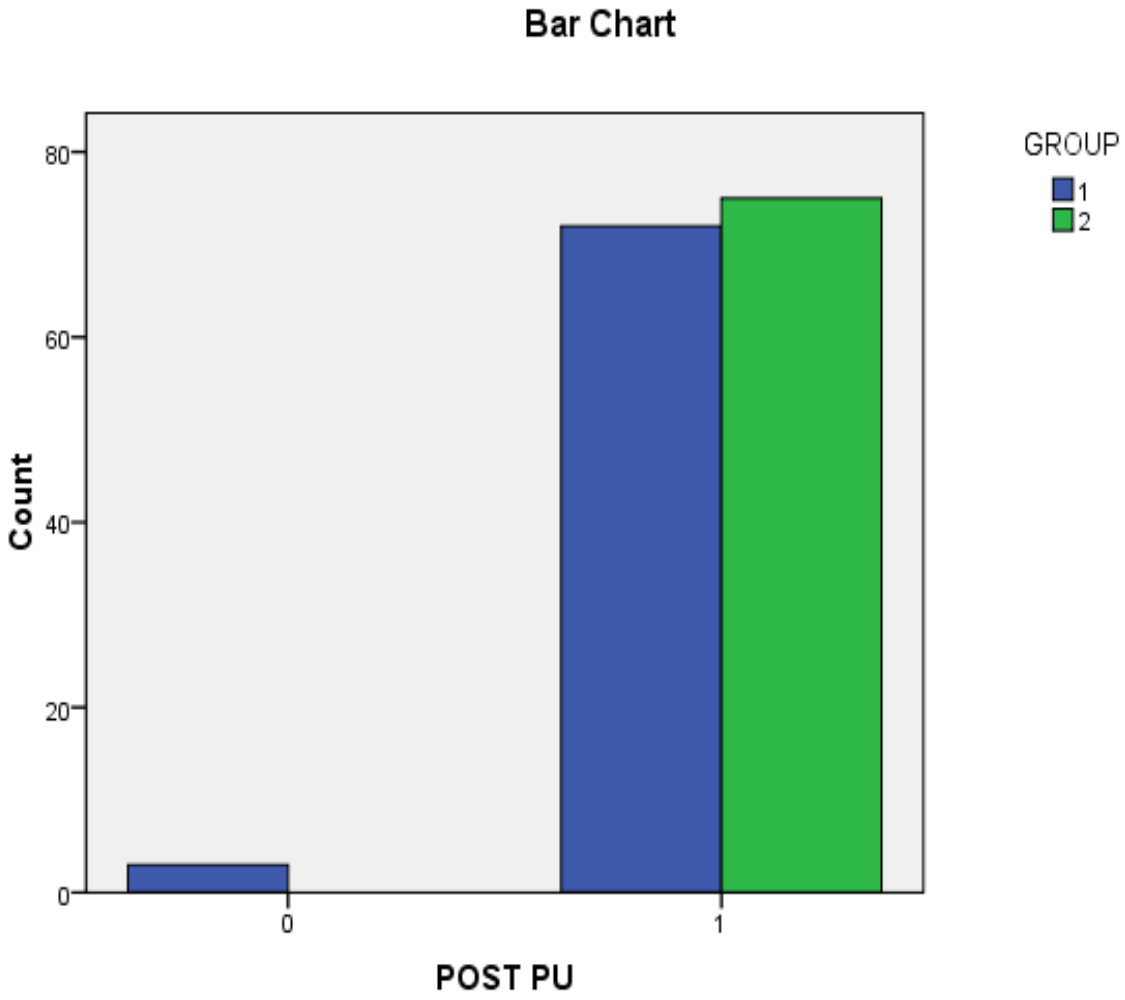
Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.061[a]	1	.080		
Continuity Correction[b]	1.361	1	.243		
Likelihood Ratio	4.220	1	.040		
Fisher's Exact Test				.245	.122
Linear-by-Linear Association	3.041	1	.081		
N of Valid Cases	150				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.50.

Computed only for a 2x2 table

Bar chart depicting post-proteinuria levels in two groups.



MATERNAL OUTCOME * GROUP

Maternal outcome 1 – Normal Delivery

Maternal outcome 2 -- LSCS

Crosstab

			GROUP		
			1	2	Total
MAT OC	1	Count	26	34	60
		% within GROUP	34.7%	45.3%	40.0%
	2	Count	49	41	90
		% within GROUP	65.3%	54.7%	60.0%
	Total	Count	75	75	150
		% within GROUP	100.0%	100.0%	100.0%

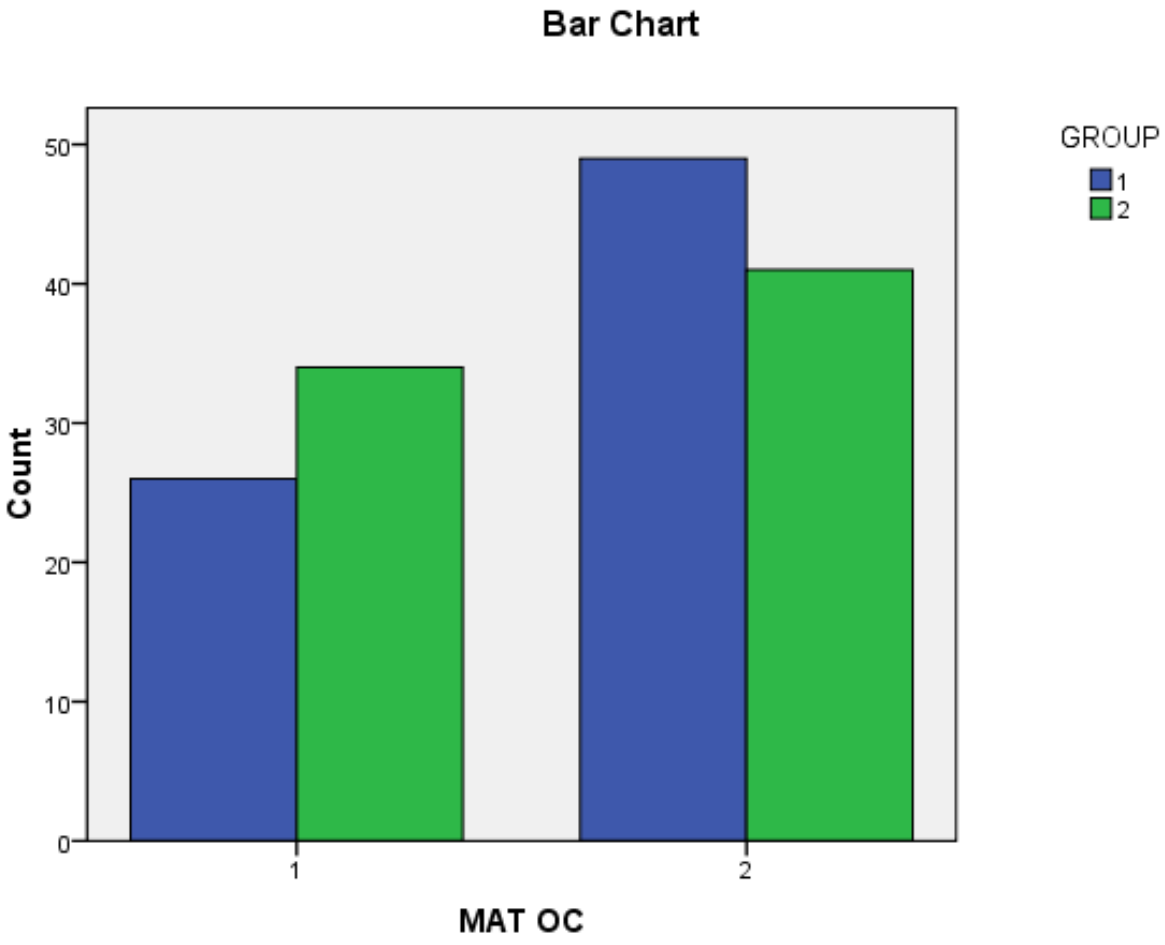
Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.778[a]	1	.182		
Continuity Correction[b]	1.361	1	.243		
Likelihood Ratio	1.782	1	.182		
Fisher's Exact Test				.243	.122
Linear-by-Linear Association	1.766	1	.184		
N of Valid Cases	150				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 30.00.

b. Computed only for a 2x2 table

Bar chart depicting Maternal outcome in two groups



MATERNAL OUTCOME * GROUP

Maternal outcome 0 – Term

Maternal outcome 1 -- Preterm

Crosstab

			GROUP		
			1	2	Total
MAT OC	**0**	**COUNT**	59	62	121
		% WITHIN GROUP	78.7%	82.7%	80.7%
	1	**COUNT**	16	13	29
		% WITHIN GROUP	21.3%	17.3%	19.3%
	Total	**COUNT**	75	75	150
		% WITHIN GROUP	100.0%	100.0%	100.0%

Chi-Square Tests

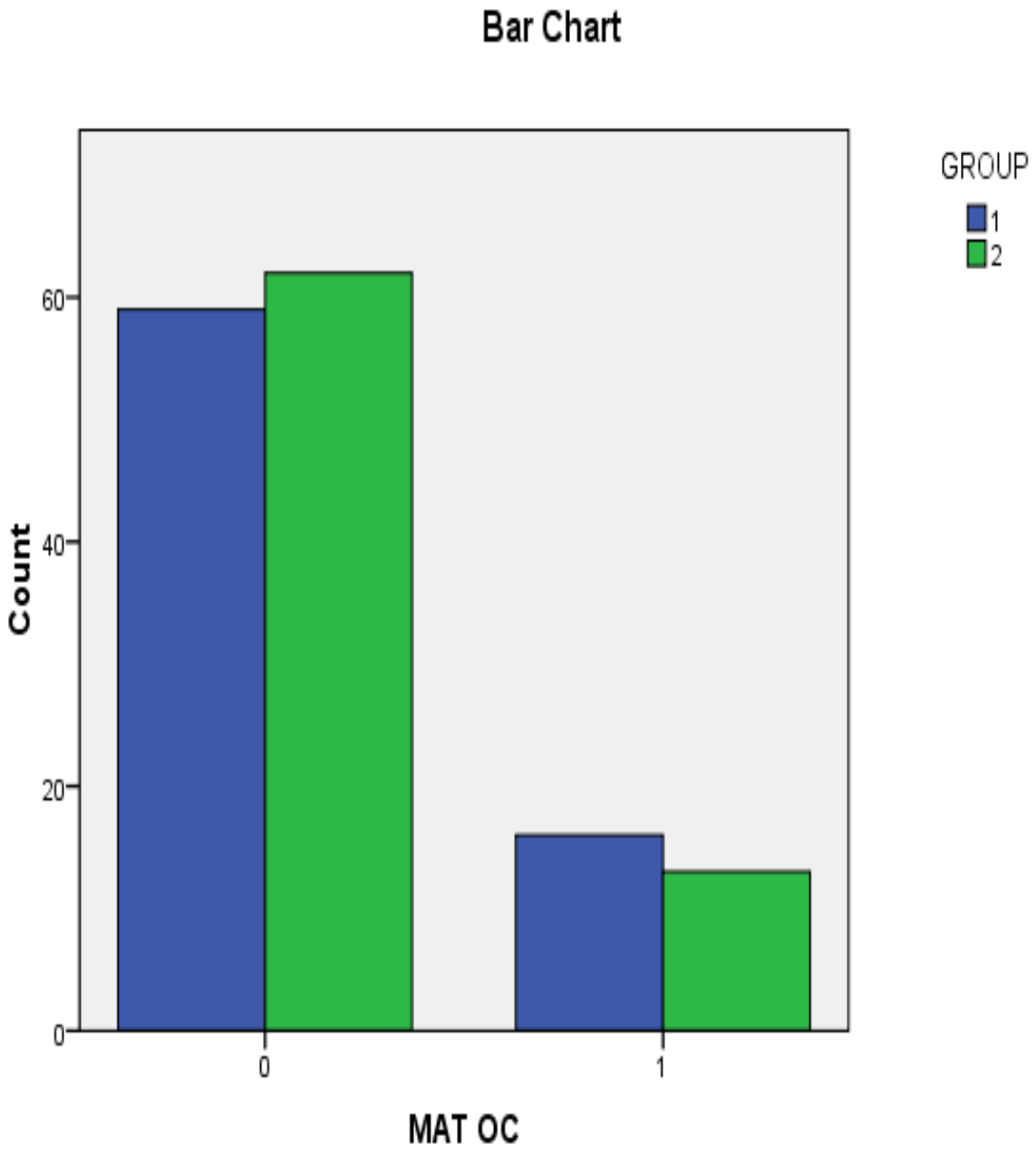
	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.385[a]	1	.535		
Continuity Correction[b]	.171	1	.679		
Likelihood Ratio	.385	1	.535		
Fisher's Exact Test				.680	.340

Linear-by-Linear Association	.382	1	.536		
N of Valid Cases	150				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.50.

b. Computed only for a 2x2 table

Bar chart depicting Maternal outcome in two groups.



FETAL OUTCOME* GROUP

Fetal outcome 1 – Live Birth

NICU * GROUP

Crosstab

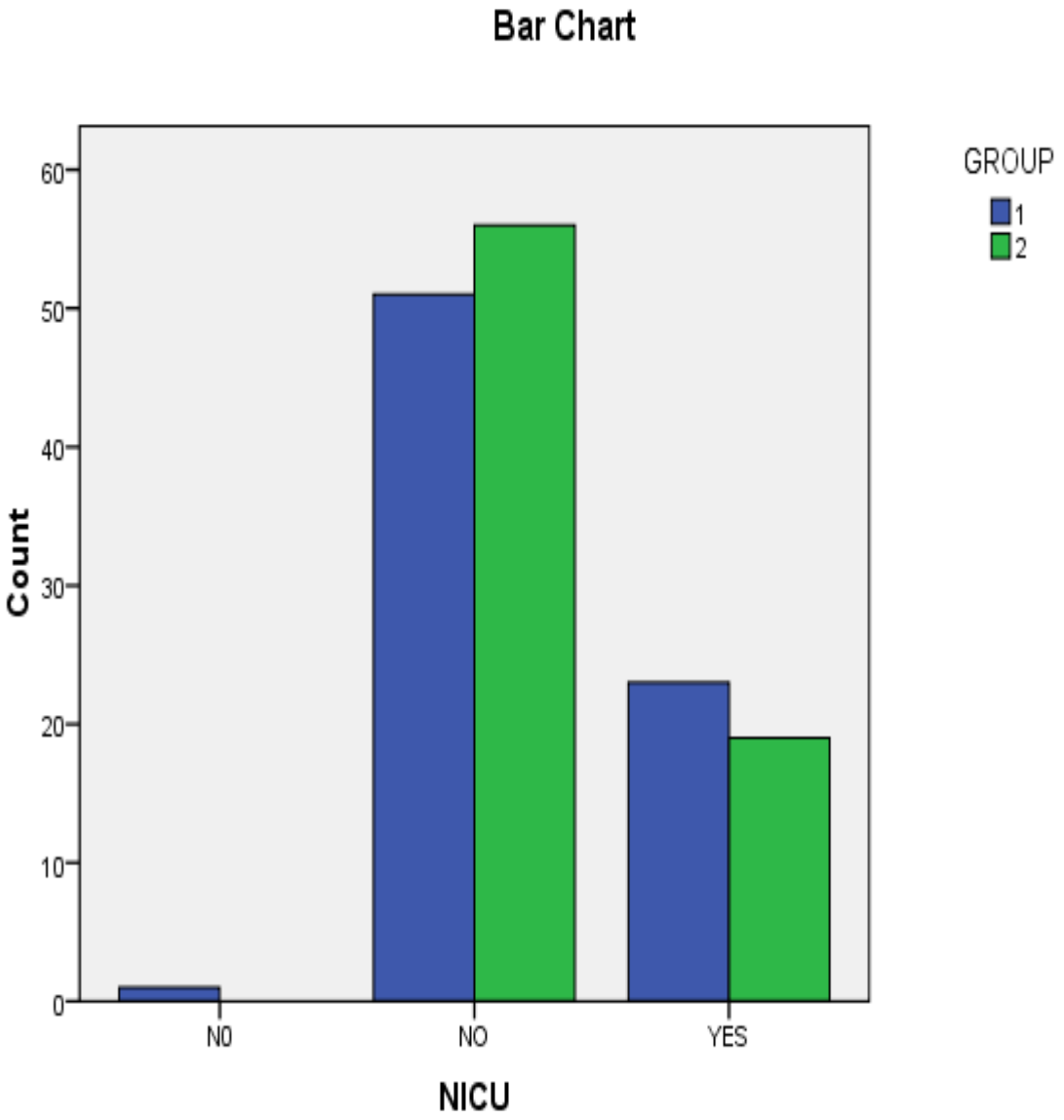
			GROUP		
			1	2	Total
NICU					
	NO	**COUNT**	52	56	107
		% WITHIN GROUP	69.3%	74.7%	71.3%
	YES	**COUNT**	23	19	42
		% WITHIN GROUP	30.7%	25.3%	28.0%
	Total	**COUNT**	75	75	150
		% WITHIN GROUP	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.615[a]	2	.446
Likelihood Ratio	2.002	2	.368
N of Valid Cases	150		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is .50.

Bar chart depicting NICU Admission in two groups.



OBSTETRIC(OBC) SCORE * GROUP

OBSTETRIC SCORE 1 – 1st Gravida

OBSTETRIC SCORE 2 – 2nd Gravida

Crosstab

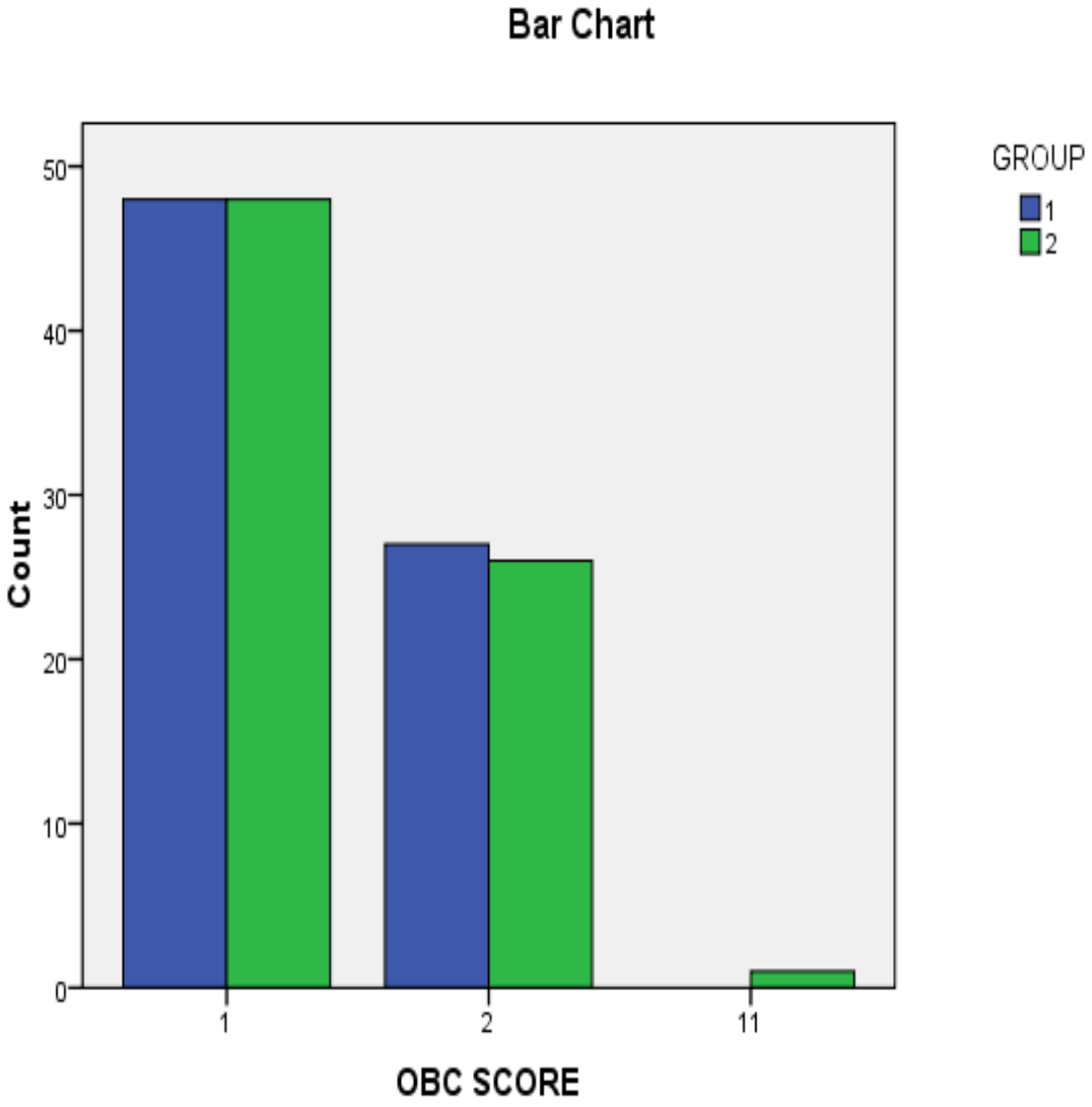
			GROUP		
			1	2	Total
OBC SCORE	**1**	**COUNT**	48	49	96
		% WITHIN GROUP	64.0%	65.3%	64.0%
	2	**COUNT**	27	26	53
		% WITHIN GROUP	36.0%	34.7%	35.3%
	Total	**COUNT**	75	75	150
		% WITHIN GROUP	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.019[a]	2	.601
Likelihood Ratio	1.405	2	.495
Linear-by-Linear Association	.636	1	.425
N of Valid Cases	150		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is .50.

Bar chart depicting Obstetric in two groups.



Stasistical Significance in Group 1(Labetalol)

Descriptive Statistics

	Mean	Std. Deviation	N
AGE	25.29	4.490	75
PREDIASTOLIC	96.13	9.138	75
PRE SYSTOLE	147.87	9.767	75
PRE MEAN	112.80	9.199	74

Correlations

		AGE	PREDIASTOLIC	PRE SYSTOLE	PRE MEAN
AGE	Pearson Correlation	1	-.051	-.038	-.036
	Sig. (2-tailed)		.664	.747	.763
N		75	75	75	74

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean	Paired differences	**Significace**
Pair 1	**PREDIASTOLIC**	96.13	75	9.138	1.055	9.867	**0.000**
	1ST FUP D	86.27	75	6.931	.800		
Pair 2	**PREDIASTOLIC**	96.13	75	9.138	1.055	12.800	**0.000**
	II FUP D	83.33	75	5.022	.580		
Pair 3	**1ST FUP D**	86.27	75	6.931	.800	2.933	**0.000**
	II FUP D	83.33	75	5.022	.580		

Paired Samples Correlations

		N	Correlation	**Sig.**
Pair 1	**PREDIASTOLIC & 1ST FUP D**	75	.708	**.000**
Pair 2	**PREDIASTOLIC & II FUP D**	75	.667	**.000**
Pair 3	**1ST FUP D & II FUP D**	75	.634	**.000**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean	Paired differences	**Significance p**
Pair 1	**PRE SYSTOLE**	147.87	75	9.767	1.128	14.267	**0.000**
	1ST FUP S	133.60	75	9.247	1.068		
Pair 2	**PRE SYSTOLE**	147.87	75	9.767	1.128	17.200	**0.000**
	II FUP S	130.67	75	7.769	.897		
Pair 3	**1ST FUP S**	133.60	75	9.247	1.068	2.933	**0.000**
	II FUP S	130.67	75	7.769	.897		

Paired Samples Correlations

		N	Correlation	**Sig.**
Pair 1	**PRE SYSTOLE & 1ST FUP S**	75	.819	**.000**
Pair 2	**PRE SYSTOLE & II FUP S**	75	.625	**.000**
Pair 3	**1ST FUP S & II FUP S**	75	.831	**.000**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean	Paired differences	**Significance p**
Pair 1	**PRE MEAN**	112.80	74	9.199	1.069	11.108	**0.000**
	1ST FUP MEAN	101.69	74	6.772	.787		
Pair 2	**PRE MEAN**	112.80	74	9.199	1.069	14.108	**0.000**
	II FUP MEAN	98.69	74	5.048	.587		
Pair 3	**1ST FUP MEAN**	101.57	75	6.801	.785	2.960	**0.000**
	II FUP MEAN	98.61	75	5.056	.584		

Paired Samples Correlations

		N	Correlation	**Sig.**
Pair 1	**PRE MEAN & 1ST FUP MEAN**	74	.847	**.000**
Pair 2	**PRE MEAN & II FUP MEAN**	74	.783	**.000**
Pair 3	**1ST FUP MEAN & II FUP MEAN**	75	.778	**.000**

Stasistical Significance in Group 2(Nifedipine)

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean	Paired differences	**Significance p**
Pair 1	**PREDIASTOLIC**	95.60	75	8.421	.972	12.400	**0.000**
	1ST FUP D	83.20	75	11.290	1.304		
Pair 2	**PREDIASTOLIC**	95.60	75	8.421	.972	17.600	**0.000**
	II FUP D	78.00	75	12.081	1.395		
Pair 3	**1ST FUP D**	83.20	75	11.290	1.304	5.200	**0.000**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean	Paired differences	**Significance p**
Pair 1	**PREDIASTOLIC**	95.60	75	8.421	.972	12.400	**0.000**
	1ST FUP D	83.20	75	11.290	1.304		
Pair 2	**PREDIASTOLIC**	95.60	75	8.421	.972	17.600	**0.000**
	II FUP D	78.00	75	12.081	1.395		
Pair 3	**1ST FUP D**	83.20	75	11.290	1.304	5.200	**0.000**
	II FUP D	78.00	75	12.081	1.395		

Paired Samples Correlations

		N	Correlation	**Sig.**
Pair 1	**PREDIASTOLIC & 1ST FUP D**	75	.719	**.000**
Pair 2	**PREDIASTOLIC & II FUP D**	75	.590	**.000**
Pair 3	**1ST FUP D & II FUP D**	75	.493	**.000**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean	Paired differences	**Significance p**
Pair 1	**PRE SYSTOLE**	145.73	75	8.411	.971	18.240	**0.000**
	1ST FUP S	127.49	75	17.765	2.051		
Pair 2	**PRE SYSTOLE**	145.73	75	8.411	.971	19.600	**0.000**
	II FUP S	126.13	75	8.683	1.003		
Pair 3	**1ST FUP S**	127.49	75	17.765	2.051	1.360	**0.457**
	II FUP S	126.13	75	8.683	1.003		

Paired Samples Correlations

		N	Correlation	**Sig.**
Pair 1	**PRE SYSTOLE & 1ST FUP S**	75	.559	**.000**
Pair 2	**PRE SYSTOLE & II FUP S**	75	.789	**.000**
Pair 3	**1ST FUP S & II FUP S**	75	.462	**.000**

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean	Paired differences	**significance**
Pair 1	**PRE MEAN**	110.40	75	14.255	1.646	12.160	**0.000**
	1ST FUP MEAN	98.24	75	9.417	1.087		
Pair 2	**PRE MEAN**	110.40	75	14.255	1.646	16.053	**0.000**
	II FUP MEAN	94.35	75	7.626	.881		
Pair 3	**1ST FUP MEAN**	98.24	75	9.417	1.087	3.893	**0.000**
	II FUP MEAN	94.35	75	7.626	.881		

Paired Samples Correlations

		N	Correlation	**Sig.**
Pair 1	**PRE MEAN & 1ST FUP MEAN**	75	.521	**.000**
Pair 2	**PRE MEAN & II FUP MEAN**	75	.476	**.000**
Pair 3	**1ST FUP MEAN & II FUP MEAN**	75	.855	**.000**

		AGE	PREDIASTOLIC	PRE SYSTOLE	PRE MEAN
AGE	Pearson Correlation	1	.206	.083	.132
	Sig. (2-tailed)		.077	.478	.258
	N	75	75	75	75

Stastitical p value in Group 1& Group 2

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean	significance
PREDIASTOLIC	1	75	96.13	9.138	1.055	**0.711**
	2	75	95.60	8.421	.972	
PRE SYSTOLE	1	75	147.87	9.767	1.128	**0.154**
	2	75	145.73	8.411	.971	
PRE MEAN	1	74	112.80	9.199	1.069	**0.225**
	2	75	110.40	14.255	1.646	

There is no significance in presystolic and pre-diastolic and mean blood pressure in Group 1 & Group 2

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean	p
1ST FUP D	1	75	86.27	6.931	.800	**0.047 significant**
	2	75	83.20	11.290	1.304	
1ST FUP S	1	75	133.60	9.247	1.068	**0.009 significant**
	2	75	127.49	17.765	2.051	
1ST FUP MEAN	1	75	101.57	6.801	.785	**0.014 significant**
	2	75	98.24	9.417	1.087	

There is Significant reduction in systolic, diastolic, mean blood pressure during 1st follow-up visit at 6 hours in both groups. In Group 2 there is more significant reduction in blood pressure than compared to Group 1, and found to clinically significant.

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean	p	
II FUP D	1	75	83.33	5.022	.580	**0.001**	**significant**
	2	75	78.00	12.081	1.395		
II FUP S	1	75	130.67	7.769	.897	**0.001**	
	2	75	126.13	8.683	1.003		
II FUP MEAN	1	75	98.61	5.056	.584	**0.001**	
	2	75	94.35	7.626	.881		

There is Significant reduction in systolic, diastolic, mean blood pressure during 2nd follow-up visit at 24 hours in both groups. In Group 2 there is more significant reduction in blood pressure than compared to Group 1, and found to clinically significant.

Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean	p
APGAR 1	1	75	6.73	.622	.072	**0.302**
	2	75	6.84	.638	.074	

APGAR 5	1	75	7.85	.485	.056	**0.323**
	2	75	7.93	.502	.058	
BIRTH WT	1	75	2.856667	2.8730614	.3317526	**0.376**
	2	75	2.558667	2.4287295	.0495054	

Apgar score of 1 & 5 in both group are more or less same and found to be not significant.

Birth weight in both group are more or less same and found to be not significant.

Summary

- There is no statistical significance between each group among age group, pre-proteinuric group, pre-eclamptic group, APGAR, birth weight.
- 1 min. APGAR with p value of 0.302, and 5 min. APGAR with p value of 0.323, found to be not significant.
- Birth weight with p value of 0.376 found to benotsignificant.
- There is no statistical difference between pre-systolic and pre-diastolic and mean blood pressure in our study.
- Pre-systolic blood pressure with p value of 0.154, pre-diastolic blood pressure with p value of 0.711, and pre-mean pressure with p value of 0.225 were found to be not significant.
- Significant reduction in blood pressure, both systolic and diastolic and mean pressure in each group during first follow-up visit and during second follow-up visit.
- P values of 1st follow-up systolic, diastolic, mean were 0.009, 0.047, and 0.014 respectively and found to be statistically significant.

- P values of 2nd follow-up systolic, diastolic, mean were 0.001, 0.001, and 0.001 respectively and found to be statistically significant.
- No statistical significance in maternal and fetal outcome in both group in our study.

DISCUSSION

Our study included 150 antenatal women recruited from antenatal and labour ward, and were randomly divided into two groups. Group 1 & Group 2 each comprising of 75 patients was subjected to drug therapy. Group 1 patients were given Tab. Labetalol 100 mg starting dose and were followed-up at 6hours and 24hours period. Group 2 patient were given Tab. Nifedipine 10mg starting dose and were followed-up at 6hours and 24hours period.

On preforming a search in Pubmed we found, three Randomised control trial (Vermilion et al, Raheem et al) similar to our study.

The principal finding of Raheem et al was that the time taken to achieve the target blood pressure was almost the same with both drugs (45 min for labetalol & 30 min for nifedepine). The findings of our study was similar to Vermillion et al study, that is nifedepine is more rapidly effective & requires fewer dosing. Vermillion's drug regimen used higher oral nifedipine doses (10 mg initially, then 20 mg for a further four doses, as required); IA Raheem et al used a flat 10 mg nifedipine dose throughout.

Our sample size determination was based on the primary outcome of efficacy of drug to achieve hypertensive control and on the prevalence of secondary outcomes, such as maternal and fetal side effects. Therefore the power of the study does not allow us to make definitive conclusions regarding the safety of either study medication. However, we are able to comment on the frequency of these outcomes within our treatment groups.

There were no other major adverse effects attributed to either of the drug regimens. Our data supports the RCTs which opine that Oral nifedipine & Oral labetalol are suitable first line anti-hypertensives for hypertensive emergencies in pregnancy.

According to our study it was found that Oral nifedipine and Oral labetalol were both effective in controlling severe hypertension in pregnancy. Smooth control of blood pressure is obtained in group where labetalol was used. Rapid and acute fall in mean blood pressure was obtainedin group where nifedipine was used.

In our study no significant difference in maternal and fetal outcome in each group, and found to be similar.

Conclusion

After analysing and comparing the results between two groups it was concluded that,

- The labetalol and nifedipine in oral form appears equally effective in controlling mean blood pressure.
- Oral nifedipine causes rapid and acute fall in mean blood pressure vs Oral labetalol which causes smooth, stepwise and gradual reduction in blood pressure.
- Maternal and fetal outcome between two groups in our study was not statistically significant.
- Previous study in this area compared only parenteral labetalol with oral nifedipine, and proved oral nifedipine proved to be superior.
- In our study, within the patient with same profile, labetalol appears to be more superior to oral nifedipine, in the form of smooth, gradual and adequate control of blood pressure.

Key to Master Chart

S.No. – Serial Number

I.P.NO. – Inpatient Number

PRE PU – Pre Proteinuria Grading

I FUP D – 1st Follow-up period Diastolic blood pressure

I FUP S – 1st Follow-up period Systolic pressure

I FUP MEAN – 1st Follow-up period Mean blood pressure

II FUP D – 2nd Follow-up period Diastolic pressure

II FUP S – 2nd Follow-up period Systolic pressure

II FUP MEAN – 2ndFollow-up period Mean blood pressure

MEAN – Mean blood pressure

POST PU – Post Proteinuria Grading

GA – Gestational Age

MAT OC – Maternal Outcome

FETAL OC – Fetal Outcome

NICU – Neonatal intensive care unit

APGAR 1 – APGAR at 1 minute

APGAR 5 – APGAR at 5 minute

OBC SCORE – Obstetric Score

BIRTH WT – Birth weight

Proforma

S. No

Name

Age

Address

Socioeconomic Status

Phone Number

Booking Status

LMP

EDD

Menstrual History

Obstetric History

Previous H/o pre-eclampsia

Previous H/o chronic hypertension

Previous H/o diabetes

Family H/o Systemic Hypertension

Any H/o Bronchial Asthma / Thyroid / Cardiac Disease / Renal Disorder / Epilepsy/ Jaundice

General examination

Height

Weight

BMI

Anaemia

Jaundice

Pedal Edema

Vitals

PR

BP

RR

Systemic Examination

Respiratory System

Cardiovascular System

CNS

Obstetric Examination

Investigation

Urine Albumin

Sugar Deposits

VDRL

NVP

Blood Grouping & Typing

CBC With Platelets

Blood Sugar

Blood Urea

Sr. Creatinine

Liver function test(LFT)

Serum Uric Acid

Fundus examination

USG Obstetrics

REFERENCES

1. Gulher Sahin, Gulmezoglu AM. Incidence morbidity and mortality of pre eclampsiaand eclampsia. Geneva Foundation for Medical Education and Research 2003.
2. Rey E, LeLorier J, Burgess E, Lange IR, Leduc L. Report of the Canadian Hypertension Society Consensus Conference: 3. Pharmacologic treatment of hypertensive disorders in pregnancy. CMAJ 1997:157:1245-54.

3a. Pregnancy, developed by the Task Force on Hypertension in (2013). Hypertension in pregnancy.

3b. Eiland, Elosha; Nzerue, Chike; Faulkner, Marquetta (2012). "Preeclampsia 2012". Journal of Pregnancy**2012**: 1–7. Lisonkova, S; Joseph, KS (Dec 2013). "Incidence of preeclampsia: risk factors and outcomes associated with

early- versus late-onset disease.". American journal of obstetrics and

3d.Jun Wu, Cizao Ren, Ralph J. Delfino, Judith Chung, Michelle Wilhelm, &

Beate Ritz (2009). Environmental Health Perspectives. Retrieved 2009-07-05

3e. Mustafa, Reem; Ahmed, Sana; Gupta, Anu; Venuto, Rocco C. (2012). "A Comprehensive Review of Hypertension in Pregnancy". Journal of Pregnancy

3. Al-Jameil (2013). "A Brief Overview of Preeclampsia". Journal of Clinical Medicine Research .
4. Mustafa, Reem; Ahmed, Sana; Gupta, Anu; Venuto, Rocco C. (2012). "A Comprehensive Review of Hypertension in Pregnancy". Journal of Pregnancy**2012**: 1–19
5. Drife, James O.; Magowan, Brian. (2004). Clinical obstetrics and gynecology. Edinburgh ; New York: Saunders. pp. 367–370.
6. McMaster-Fay RA (2008). "Pre-eclampsia: a disease of oxidative stress resulting from the catabolism of DNA (primarily fetal) to uric acid by xanthine oxidase in the maternal liver; a hypothesis.". Bioscience Hypotheses**1**: 35–43

7. Laresgoiti-Servitje E, Gómez-López N, Olson DM (April 2010) “ An immunological insight into the origins of pre-eclampsia” Hum Reprod Update**16** (5): 510–24
8. Redman CW, Sargent IL (2005). "Latest Advances in Understanding Preeclampsia". Science**308** (5728): 1592–1594
9. Davis, J. A.; Gallup, G. G. J. (2006). "Preeclampsia and other pregnancy complications as an adaptive response to unfamiliar semen". In Platek, Steven M; Shackelford, Todd K. Female Infidelity and Paternal Uncertainty. p. 191
10. Arulkumaran, N.; Lightstone, L. (December 2013). "Severe pre-eclampsia and hypertensive crises". Best Practice & Research Clinical Obstetrics & Gynaecology**27** (6): 877–884
11. Hnat MD, Sibai BM, Caritis S, et al: Perinatal outcome in women with recurrent preeclampsia compared with women who develop preeclampsia as nulliparas. Am J Obstet Gynecol 2002; 186:422.
12. Rey E, LeLorier J, Burgess E, Lange IR, Leduc L. Report of the Canadian Hypertension Society Consensus Conference: 3. Pharmacologic treatment of hypertensive disorders in pregnancy. CMAJ 1997:157:1245-54.
13. A randomized, double-blind trial of oral nifedipine and intravenous labetalol in hypertensive emergencies of pregnancy.[Am J Obstet Gynecol. 1999]

14. A randomized, double-blind, hemodynamic evaluation of nifedipine and labetalol in preeclamptic hypertensive emergencies.[Am J Obstet Gynecol. 1999]
15. Role of antihypertensive therapy in mild to moderate pregnancy-induced hypertension: a prospective randomized study comparing labetalol with alpha methyldopa.[Arch Gynecol Obstet. 2012] Raheem IA, Saaid R, Omar SZ, Tan PC. Oral nifedipine versus intravenous labetalol for acute blood pressure control in hypertensive emergencies of pregnancy: a randomised trial. BJOG. 2012;119(1):78-85.
16. Gulher Sahin, Gulmezoglu AM. Incidence morbidity and mortality of pre eclampsiaand eclampsia. Geneva Foundation for Medical Education and Research 2003.
17. Rey E, LeLorier J, Burgess E, Lange IR, Leduc L. Report of the Canadian Hypertension Society Consensus Conference: 3. Pharmacologic treatment of hypertensive disorders in pregnancy. CMAJ 1997:157:1245-54.
18. Wen SW, Demissie K, Yang Q, Walker MC: Maternal morbidity and obstetric complications in triplet pregnancies and quadruplet and higher-order multiple pregnancies. Am J Obstet Gynecol 2004; 191:254.

19. Hnat MD, Sibai BM, Caritis S, et al: Perinatal outcome in women with recurrent preeclampsia compared with women who develop preeclampsia as nulliparas. Am J Obstet Gynecol 2002; 186:422.
20. Duley L, Henderson-Smart DJ, Meher S. Drugs for treatment of very high blood pressure during pregnancy (Review). The Cochrane Library 2012, Issue 4.