"A RANDOMISED CONTROL TRIAL TO COMPARE EFFICACY OF 10 gm INTRAMUSCULAR SINGLE LOADING DOSE MgSO4 WITH STANDARD PRITCHARD REGIME FOR IMMINENT ECLAMPSIA AND ECLAMPSIA"

By

DR. MOUNIKA REDDY CHITIKELA

Dissertation submitted to BLDE University, Vijayapur.

In partial fulfillment of the requirements for the degree of

MS

IN

OBSTETRICS AND GYNAECOLOGY

Under the guidance of

DR.MRS.SHAILAJA. R. BIDRI.

PROFESSOR, M.D., D.G.O.,

DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY,

SHRI B.M. PATIL MEDICAL COLLEGE, VIJAYAPUR.

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Date:

Place: Vijayapur **Dr. MOUNIKA REDDY CHITIKELA**

B. L. D. E. U'S

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Place:

Date:

Dr. MRS.SHAILAJA.R.BIDRI,

Professor., M.D., D.G.O.

Department of Obstetrics & Gynaecology, Shri B.M. Patil Medical College, Vijayapur.

B. L. D. E. U'S

SHRI B. M. PATIL MEDICAL COLLEGE HOSPITAL &

RESEARCH CENTRE, VIJAYAPUR

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Seal and signature of

Place : HOD of Obstetrics and Gynaecology

Date : **Dr. P. B. Jaju**.**M.D, DGO**

BLDEU's Shri B.M. Patil

Medical College, Hospital & Research

Centre, Vijayapur.

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Place :

Date :

Seal and signature of the principal

DR.M.S.BIRADAR **M.D.**

BLDEU's Shri B.M. Patil

Medical College, Hospital &

Research Centre, Vijayapur.

B. L. D. E. U'S

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ACKNOWLEDGEMENTS

Firstly, I pray to the almighty god, thanking him for the bounty of life. I thank my parents who have nurtured me and supported me in all my endeavors, without their love and innumerable sacrifices; I would not be the person I am today.

I would like to express my deep gratitude to my guide, **Dr. MRS.SHAILAJA. R. BIDRI** **M.D.D.G.O, Professor**, Department of Obstetrics and gynaecology, BLDEU'S Shri B. M. Patil Medical College; who was ever encouraging in her approach while helping me through my postgraduate course. She was always supportive and allowed me to work and develop at my own pace, guiding wherever necessary. Her meticulous approach, dynamic decisions and quick attention along with giving equal value to time was inspiring. Without her guidance and support, it would have been impossible to complete this dissertation.

I am highly indebted to **Dr. P.B.JAJU, Dr. S.R.MUDANUR, Dr. V.R.GOBBUR, Dr. MANPREET KAUR,** Professor's, Department of Obstetrics and gynaecology, Shri B. M. Patil Medical College Vijayapur, for their invaluable guidance, constant encouragement and support in any endeavor which I undertook. They were an example to everyone and inculcated a work ethic which will go a long way in developing my career.

I express my sincere gratitude to **Dr. NEELAMMA PATIL,** **M.S.** Associate Professor, Department of Obstetrices and gynaecology, Shri B.M. Patil Medical College Vijayapur who was inspiration throughout my post graduation course.

It gives me pleasure to express my gratitude to **Dr. Shoba** **D.G.O , DNB.** Senior Resident Assistant Professor, **Dr. Aruna** **M.S,** Assistant Professor Department of Obstetrics and gynaecology, Shri B. M. Patil Medical College Vijayapur, for their constant advice and encouragement.

I wish to express my thanks to **Dr. M. S. BIRADAR**, Principal, B.L.D.E.U'S Shri B. M. Patil Medical College Vijayapur, for allowing me do this work, to access medical records, utilize clinical material and facilities in this institution.

I thank my husband **Dr Nikhil**, my brother, my father and mother for their continuous support and love.

I thank my friends **Dr.Uday Jonna, Dr. tejasvi & Dr. nandini** for their constant support and help during my postgraduate course.

I thank my friends and my colleagues **Dr. Keval , Dr. Deepa , Dr. Aishwarya , Dr. Lubna**, **Dr. Shilpy Kumari, Dr.Pooja ,** PGs in the Department of Obstetrics and gynaecology who rendered immense help and support during my postgraduate course. I thank them from my heart.

I thank the statistician **Mr .Shah Nawaz** for his guidance in statistics and **Mr . Kalyanakumar Awati** of Preeti Net Zone for helping me in printing the thesis.

I express my indebtedness to all patients who contributed in no small way to this dissertation, but, for whom this entire exercise would have been unimaginable. This study is dedicated to them.

Place: Vijayapur **Dr. MOUNIKAREDDYCHITIKELA**

Date:

ABSTRACT

OBJECTIVE:

To study the effectiveness, side effects , maternal and perinatal outcome using 10gm intramuscular single loading dose MgSO4 in comparison with the standard Pritchard regimen in imminent eclampsia and eclampsia.

MATERIALS AND METHODS:

All cases of Eclampsia (Ante partum / Intrapartum / postpartum) and Imminent eclampsia (hypertension with headache, epigastric pain, vomiting and blurring of vision) will be included in the study.

Cases are divided into two groups , **Group I (control) patient's will receive magnesium sulphate by Pritchard regimen and Group II (Study) patients will receive 10 gm i.m. single loading dose magnesium sulphate . Equal number of Cases are allotted into Group I and Group II according to randomization table baring a seed number 29254.**

Primary outcome measures will be the occurrence of fits in those with imminent eclampsia & further convulsions in patients of eclampsia. Secondary outcome measures will be maternal outcome & fetal outcome (APGAR at 5min of birth & duration of NICU stay).

RESULTS:

10 g intramuscular single dose regimen (group II) was successful in preventing occurrence of convulsions prophylactically in imminent eclampsia patients but recurrence of convulsions in eclampsia patients was significantly high

(37%) in group II compared to standard pritchards regimen(2.85%) suggesting the need for higher dose.

There were no maternal deaths in both the groups.

Apgar score at 5 minutes was less in group I and the duration of NICU stay prolonged compared to group II indicating the side effect of higher dose of magnesium sulphate on fetus.

CONCLUSION:

10 gm single dose intramuscular dose is as effective as standard regimen in preventing occurrence of convulsion in imminent eclampsia patients prophylactically but the dose is not sufficient enough to prevent recurrence in eclampsia patient.The dose used in our study had efficient secondary outcome measures with comparable maternal outcome and good fetal outcome.

Proper selection of the patient for 10 gm single intramuscular dose would avoid the side effects of higher dose on both fetus and mother.

Keywords:

Antepartum eclampsia; intrapartum eclampsia; postpartum eclampsia; Magnesium sulphate; ; Pritchard regimen; single 10 gm i.m dose.

LIST OF ABBREVIATIONS

VEGF	-	Vascular Endothelial Growth Factor
USG	-	Ultrasonography.
TNF	-	Tumor Necrosis Factor
RTI	-	Respiratory tract Infection
RFT	-	Renal Function Tests
PPH	-	Post Partum Haemorrhage
No	-	Number
NMDA	-	N-Methyl D-Aspartate
Mm	-	Millimetre
MgSO4	-	Magnesium Sulphate
Mg	-	Milligram
mEq	-	Milliequivalents
LSCS	-	Lower Segment Caesarean Section
LFT	-	Liver Function Tests
L	-	Litres
IV	-	Intravenous
IM	-	Intramuscular
HELLP	-	Hemolysis Elevated Liver Enzymes Low Platelets
Hb	-	Hemoglobion
GABA	-	Gama amino benzoic acid
FOGSI	-	Federation of Obstetricians & Gynaecological Society of India
FHR	-	Fetal Heart Rate
ET	-	Endothilins

ECG	-	Electrocardiogram
ECF	-	Extra cellular fluid
DIC	-	Disseminated Intravascular Coagulation
CT	-	Computerised Tomography
CNS	-	Central Nervous System
CET	-	Collaborative Eclampsia Trial Group
CCB	-	Calcium Channel Blockers.
CBC	-	Complete Blood Count
B.P	-	Blood Pressure
ARM	-	Artificial Rupture of Membranes
AF	-	Amniotic fluid
ADH	-	Antidiuretic Hormone
ACE	-	Angiotensin Converting Enzyme

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INTRODUCTION

Pre-eclampsia is defined as being a pregnancy specific syndrome of elevated blood pressure (>140/90mmHg) and proteinuria of >100mg/dl by urine analysis or >300mg in a 24 hour urine sample, after 20 weeks of gestation.[1]

Eclampsia is derived from the Greek word meaning “flash of lightening”, to shine forth. Eclampsia is defined as the occurrence of generalized tonic-clonic convulsion in women with pre-eclampsia, not caused by any other neurological or medical disorders.[2]

Pregnancy induced hypertension is one disorder of pregnancy which continues to take a heavy toll of maternal and fetal lives , remaining one of the unsolved part of the deadly triad of maternal deaths (hemorrhage, infection and pregnancy induced hypertension). With deaths from hemorrhage and infection becoming less common, those associated with eclampsia assumes greater importance.

In South-Asian region pregnancy induced hypertension accounts for 10-38% of maternal deaths. In India eclampsia forms 14% of the maternal deaths.

Eclampsia now a rare disease in developed countries (1:2000 deliveries) where modern antenatal care is available to all pregnant women, as a result preeclampsia is detected early and treated effectively so that the convulsive stage is seldom reached. The picture is very different in many developing countries (1:100 to 1:1700 deliveries) particularly in rural areas where eclampsia may present for treatment in deep coma after many convulsions at home.

The first and foremost principle of management of eclampsia is control of convulsions.

In the recent years with many large studies demonstrating the superiority of magnesium sulphate over other drugs for preventing and controlling eclampsia, $MgSO_4$ has become the first line and preferred drug of choice for treatment and prevention of seizures.

Although, these studies have provided irrefutable evidence of effectiveness of magnesium sulphate to prevent seizures, various regimens with different dosages have been used over the years, question still remains about the ‘minimum effective dose’ of magnesium sulphate.

OBJECTIVES OF THE STUDY

To study the effectiveness, side effects , maternal and perinatal outcome using 10gm intramuscular single loading dose $MgSO_4$ in comparison with the standard Pritchard regimen in imminent eclampsia and eclampsia.

REVIEW OF LITERATURE

"Eclampsia" (to flash out suddenly, to come on suddenly, flash of lightening, to shine forth) term coined by Verandeus in 1668.

Manriceaus [3] recognized that the disease could be treated by prompt delivery.

In 1778 , Levergel advocated the termination of pregnancy to treat eclampsia.

In 1840's John Lever [4] made an important contribution by describing the 'impending signs' of eclampsia. Lever also said that proteinuria of pre-eclampsia and eclampsia abated and disappeared after delivery therefore concluded that eclampsia was not nephritis.

Alfred suggested the role of toxins responsible for pre-eclampsia in 1894. The condition came to be called the 'Toxemia of pregnancy'. Management of this condition was tried by a variety of methods over the years.

Stroganoff [5] and Tweedy [6] suggested the role of sedatives to control convulsions.

In 1925, Lazard [7] introduced the first intravenous regimen.

In 1926 , Dorsett introduced the first intramuscular regimen of magnesium sulphate which was used in the United States starting from the second half of the last century.

In India , Krishna Menon [8] introduced and popularized Sheer's 'Lytic cocktail regimen using chlorpromazine , phenergan and pethidine.

In 1906, Horn from Germany used magnesium sulphate intrathecally for eclampsia.

In 1955, Pritchard [9] introduced the famous regimen named after him at Parkland Memorial Hospital.

Zuspan [10] introduced his intravenous infusion regimen in 1964 .

Diazepam was suggested and used for eclampsia by Lean [11] in 1968.

Sibai [12] (University of Tennessee) introduced the IV infusion regimen named after him in 1990.

In 1995, results of the Collaborative Eclampsia Trial (CET) was published demonstrating the superiority of magnesium sulphate over diazepam and phenytoin for eclampsia and interestingly magnesium sulphate was used with a lesser dosage of 1 g / hr in this study.[13]

Suman Sardesai [14] used the " Low dose magnesium sulphate regimen" in VM Hospital Sholapur and published encouraging results with reduced dose of magnesium sulphate in 1997.

The results of another large multicentric trial the Magpie (Magnesium sulphate for prevention of eclampsia) trial [15] was published in 2002 , establishing further that magnesium sulphate was the ideal anticonvulsant for pre-eclampsia / eclampsia.

Okusanya BO *et al* in 2012 [16], at a tertiary referral centre in Northwest Nigeria has concluded potential use of intramuscular 10 gram loading dose of MgSO4 at the primary health care level in Nigeria.

In another study conducted by Narayanajana *et al* in 2013 [17], at Burdwan Medical College, Burdwan, India; The low-dose regimen was safe and effective for the management of eclampsia in a region where most women are of low maternal weight.

Study conducted by Bangal. V. *et al* in 2009 [18] ,at a Rural medical college, Pravara institute of medical sciences, Loni, Maharashtra, India; found that Low dose magnesium sulphate regime was found to be safe and effective in eclampsia.

Study was conducted by N. S. Kshirsagar *et al* in 2013 [19] , at Krishna Institute of medical sciences, Karad, India; concluded that low dose MgSO4 regime is equally effective in controlling / preventing convulsions when compared with Pritchard regime.

INCIDENCE

The incidence varies from developing to developed countries. The incidence of pregnancy induced hypertension varies from 5-10%, the incidence of pre-eclampsia varies from 2-8% (magpie), the incidence of eclampsia varies from 1 in 100 to 1 in 1700 in developing countries and1 in 2000 in developed countries. Incidence in India varies from 1 in 30 to 1 in 500.

Risk factors

- Nulliparas.
- Teenagers.
- Advanced maternal age.
- Poor socio-economic status.
- Previous pregnancy induced hypertension / eclampsia / hypertension.
- Renal disease.
- Family history of hypertension , diabetes mellitus.
- Twins, Molar pregnancy, hydraminos.
- Connective tissue disorders.
- Seasonal.
- Regional.

DEFINITIONS

Normal pregnancy is characterized by a fall in blood pressure, detectable in the first trimester and usually reaching a nadir in the second trimester. Blood pressure increases towards pre-conception levels towards the end of the third trimester.

Hypertensive disorders complicating pregnancy is defined as blood pressure greater than or equal to 140 mmHg and/ or diastolic blood pressure greater than or equal to 90 mmHg. This is best confirmed when evidence is present in two occasions at least 6 hours apart within 7 days.

Detecting an increase in blood pressure from pre-conceptional blood pressure (30/15mmHg), rather than relaying on an absolute value, has in the past been considered useful in diagnosing pre-eclampsia.

Available evidence shows that such women are not likely to experience increased adverse pregnancy outcome**.**

According to National High Blood pressure Education Program(2000)[20]

Hypertensive disorders complicating pregnancy are classified in to 4 types

1) Gestational hypertension
2) Pre-eclampsia and eclampsia syndrome
3) Chronic hypertension.
4) Pre-eclampsia syndrome superimposed on chronic hypertension.

1) Gestational hypertension:- Gestational hypertension is characterized by systolic blood pressure >140 mmHg or diastolic blood pressure >90 mmHg for the first time during pregnancy, onset after 20 weeks of gestation, with no proteinuria. Almost half of these women subsequently develop pre-eclampsia syndrome, which includes signs such as proterinuria and thrombocytopenia , or symptoms such as headache or epigastric pain. Gestational hypertension reclassified as transient hypertension if evidence of pre-eclampsia does not develop, and the blood pressure returns to normal by 12 weeks postpartum.

2) Pre-eclampsia and eclampsia syndrome:- Pre-eclampsia is characterized by blood pressure >140/90 mmHg after 20 weeks gestation, proteinuria >300 mg/24 hours or >1+ dipstic test . Pre-eclampsia is again categorized as severe and nonsevere.

Indications of severe pre-eclampsia

- Diastolic Blood pressure >110 mmHg.
- Systolic Blood pressure >160 mmHg.
- Proteinuria >3+.
- Headache.
- Visual disturbances.
- Upper abdominal pain.
- Oliguria.
- Elevated serum creatinine.
- Thrombocytopenia .
- Serum transaminase elevation.
- Fetal growth restriction.
- Pulmonary edema.

Eclampsia:- Onset of convulsions in a woman with pre-eclampsia that cannot be attributed to other causes is termed eclampsia.

3) **Chronic Hypertension**:- Blood Pressure >140/90 mmHg before pregnancy or diagnosed before 20 weeks gestation, not attributable to gestational trophoblastic disease, or hypertension first diagnosed after 20 weeks gestation and persistent after 12 weeks postpartum.

4) **Superimposed pre-eclampsia on chronic Hypertension**:- New onset proteinuria > 300 mg/24 hours in hypertensive women but no proteinuria before 20 weeks gestation. A sudden increase in proteinuria or blood pressure or platelet count <100,000/ul in women with hypertension and proteinuria before 20 weeks gestation.

ETIOLOGY

It is a multisystem disorder with no known proven etiology, which still remains as an obstetric enigma despite extensive research.

It is a disorder full of hypotheses, the widely accepted of these being

A. PLACENTAL ISCHEMIA HYPOTHESIS

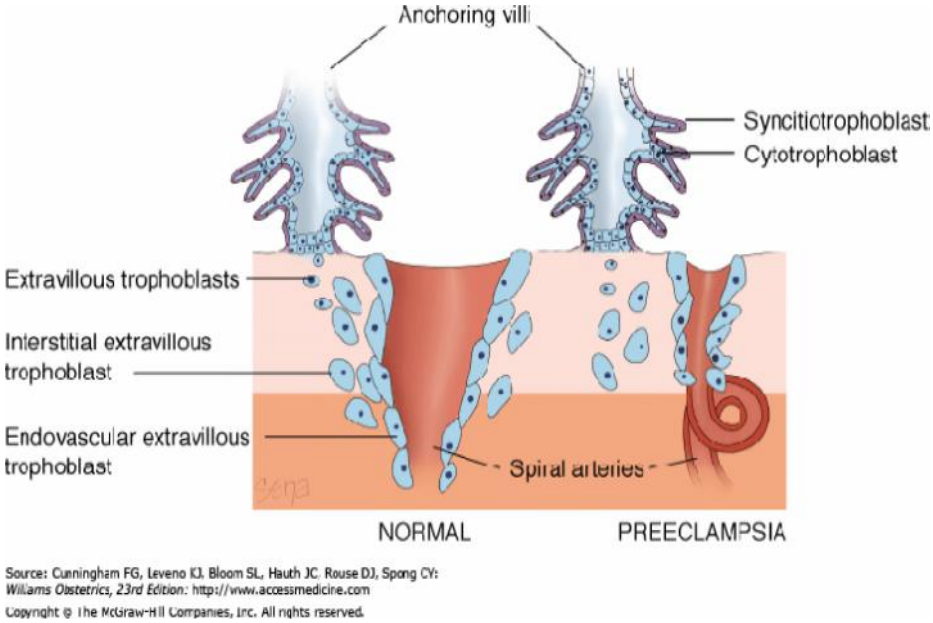
B. THE IMMUNE MALADAPTATION HYPOTHESIS

C. FREE OXYGEN RADICAL HYPOTHESIS.

D. GENETIC HYPOTHESIS

PLACENTAL ISCHEMIA HYPOTHESIS

Abnormal placentation, that is the failure of second wave of trophoblastic invasion of the spiral arteries, as the cause of pre-eclampsia is one of the widely accepted hypothesis but still remains to be validated. Placental hypoperfusion results in release of factors into maternal circulation and activation of vascular endothelium. With a definitive etiology for pregnancy induced hypertension till evading obstetrics, there is a substantial evidence of a placental trigger atleast.



THE IMMUNE MALADAPTATION HYPOTHESIS

There is maternal immune tolerance to paternally derived placental and fetal antigens. Loss of this tolerance, or perhaps its a dysregulation, is another theory cited to account for pre-eclampsia syndrome. Certainly the histological changes at the maternal-placental interface are suggestive of acute graft rejection. (Labarrere [21] 1988)

The risk of pre-eclampsia is enhanced where formation of blocking antibodies to placental antigenic sites might be impaired. They arise where effective immunisation by previous pregnancy is lacking as in first pregnancy (or) in multiple pregnancy where number of antigenic sites provided by the placenta is more compared to the amount of antibody.

Bardeguez *et al* [22] (1991) noted that woman who develop pre-eclampsia have lower proportion of helper T cells (Th1) than normotensive woman. Th1/Th2 imbalance with Th2 dominance may be mediated by adenosine, which is higher in serum of preeclampsia woman than normotensives.

Pre-eclampsia is common in woman with anticardiolipin antibodies, Antibodies associated with β2-glycoprotein1 appear more relevant . Immune complexes and anti endothelial cell antibodies may also be involved (Taylor and Roberts [23],1999).

THE FREE OXYGEN RADICAL HYPOTHESIS

Oxidative stress secondary to inflammatory changes with the release of a variety of substance which mediate vascular damage like proteases, oxygen radicals and leukotrienes .

The oxidative stress is associated with reduced antioxidants (reducing systems) potential provoking a greater degree of damage to the vessel wall (Homzova M et *al* [24] 2001).

THE GENETIC HYPOTHESIS

Preeclampsia is a multifactorial, polygenic disorder. In their comprehensive review, Ward and Lindheimer [25] (2009) cite an incident risk of pre-eclamptic in 20 to 40 % for daughters of preeclampsia mothers; 11 to 37 % for sisters of pre-eclamptic women; and 22 to 47 %in twins.

Ness[26] (2003) suggested that the tendency for pre-eclampsia is inherited.

Cooper and Liston[27] (1979) suggested that susceptibility to pregnancy induced hypertension is due to single recessive gene. Trogstad *et al* [28] (2004) suggested polygenic inheritance.

Others suspected etiologies include

- Endothelial dysfunction.
- Association with obesity, insulin resistance, lipoprotein disorders.
- Association with hyperhomocystenemia
- Dietary deficiencies like calcium, sodium and vitamin E (Bucher et al [29] 1996).
- Association with thrombophilia.
- Association with prostaglandins (Scott W *et al* [30] 1985), NO (Beneditto *et al* [31] 2000), Endothelins (Alfredo Nova *et al* [32] 1991), Vascular endothelial growth factor (VEGF) [Baker *et al* [33] 1995].
- Association with coagulation and fibrinolytic system.

The etiology of eclampsia remains unknown and so also the empty shield on a portico at the Chicago Lying In Hospital continues to remain empty, designated for the person who discovers the etiology of eclampsia.

PATHOLOGY

Although the etiology remains unsolved , the pathological changes caused in the various organs of the body is well documented.

PLACENTA

- Primary trophoblastic invasion partially impaired.
- Increased evidence of aging.
- Secondary trophoblastic invasion grossly impaired / absent, the typical vascular lesion found is termed ‘acute vascular atherosis’ (Labarrere [21] 1988) due to presence of foam cells , which is also seen in IUGR.
- Evidence of endothelial damage (Sibai [34] 1999).
- Ischemia leads to infarcts, patchy necrosis, intracellular damage to syncytiotrophoblast , increase villous cytotrophoblast , obliterative endarteritis (Fox [35] 1988).
- Recently the incomplete development of fetal placental microvasculature has been suggested (Macara *et al* [36] 1995) .

KIDNEY'S

- Glomerular endotheliosis (Spargo[37] l959) with reduced renal perfusion and glomerular filtration. Consequently creatinine clearance is reduced. Modestly increased plasma urea, hyperurecimia (Varma [38] 1982), proteinuria, tubular, and granular cast are seen. The calcium excretion is reduced.

LIVER

- Hepatic lesions includes hemorrhages, infarcts, necrosis, periportal fibrin deposits, thrombosis of the portal tract and hepatic artery branches. Alteration in hepatic function test with raised liver enzymes, plasma bilirubin.

- Rarely subcapsular hematoma, hepatic rupture is seen indicative of a fulminating disease.

- HELLP syndrome (Wienstein [39] 1982) is the association of hemolysis, elevated liver enzymes and low platelet count forming a well recognized complication of pregnancy induced hypertension with increased neonatal and maternal mortality (Magann, Martin 1995 [40]).

HEART

- Generalized vasoconstriction with increased systemic hypertension, increased vascular resistance and increased permeability leads to constricted plasma volume. Myocardium is rarely impaired, Cardiac output varies.

HAEMATOLOGICAL :

- Thrombocytopenia, decreased antithrombin, increased fibronectin and increased plasma rennin.

ENDOCRINOLOGICAL :

- Renin**,** angiotensin and aldosterone are not increased as much as in normal pregnancy. Deoxycortisone shows considerable increase with ADH normal or low.

BRAIN

- Pathological findings include cerebral edema, haemorrhage, thrombotic lesions and fibroid necrosis.
- According to Williams *et al* [41] (1999) associated with vasospasm with or without loss of cerebral auto-regulation.

EYE

- Ohno *et al* [42] (1999) retinal artery vasospasm, retinal artery detachment, amaurosis are seen. Prognosis is usually good with vision returning to normal within one week.

FLUID AND ELECTROLYTE:

- ECF volume is increased.

Clinical Aspects:

Eclampsia is a serious complication of pregnancy.

The pathophysiology of eclampsia is thought to involve cerebral vasospasm leading to ischemia, disruption of the blood brain barrier and cerebral edema.

In 80 to 85 % cases it is preceded by a stage of imminent eclampsia characterized by warning signs and symptoms that include headache, giddiness, visual disturbances (dimmed vision, flashes of light, photophobia, complete blindness) according to Mac Gillvary [43] (1983), nausea , vomiting, epigastric pain (Arias *et al* [44] 1976) and decreased urine output. It arises without any obvious symptoms in 15 to 20% of the cases.

Signs/symptoms are

- Epigastric or right upper quadrant pain (86 - 90%).
- Right upper quadrant tenderness (86%).
- Headache (50 %).
- Increased diastolic blood pressure (more than 1l0mm Hg) (67%).
- Nausea and vomiting (45.84%).
- Proteinuria (more than 2+ by dipstick) [85 - 96%].
- Overt edema (58· 67 %).

50% of the cases occur antepartum, 25% intrapartum and the rest 25% postpartum.

Postpartum eclampsia usually occurs within the first 48 hours but may occur even 2 - 3 weeks later. 25% of patients with eclampsia have only mild pre-eclampsia prior to the seizures.

Areas of cerebral vasospasm may be severe enough to cause focal ischemia, which may in turn lead to seizures. Alterations in cerebral blood flow and tissue edema induced by vasospasm may result in headaches , visual disturbances, and hypertensive encephalopathy, resulting in a seizure. An awareness of the diverse presentations is important to allow prompt and adequate treatment.

The differential diagnosis includes

- Cerebral venous thrombosis.
- Cerebral tumors.
- Intracranial hemorrhage.
- Drug overdoses.
- Epilepsy.
- Head trauma.
- Stroke (ischemic or nonischemic).
- Electrolyte imbalance.
- Infections (Meningitis ,encephalitis).
- Hysteria.

The actual convulsive attack consists of four stages:

Stage 1 (Premonitory stage): Lasts for a few seconds to half a minute. Patient becomes unconscious, pupils dilate, eyes roll from side to side, turn to one side and fix, twitching of the face and the hands

Stage 2 (Tonic stage): Lasts for a few seconds. The body becomes rigid with distorted features, hands are clenched, arms flexed

Stage 3 (The clonic stage): Lasts for half a minute to two minutes ,alternative contraction and relaxation of the muscles, clenching of the jaw, tongue bites, twitching in the face starting around the angle of the mouth , extending to the arm and leg of one side of the body. The face becomes cyanosed, tongue protrudes out with frothing in the mouth, and breathing becomes steratorius. Muscular movements are so forceful that the woman may throw herself out of the bed, if not protected her tongue is bitten by the violent action of the jaws.

Stage 4 (Stage of coma): The movements cease, the patient lies quiet, coma supervenes, and respiration gradually quietens down. The patient wakes up after a short time with amnesia of the events, sometimes patient may go into deep coma from which she may not recover. Fits may occur in quick succession leading to a condition called 'status epilepticus'.

During convulsions the temperature rises (rise of more than 37ºC is a grave sign suggestive of cerebral hemorrhage), the pulse rate and blood pressure rises.

The first convulsion is usually the fore runner for others.

The number of convulsions varying from 1 or 2 in mild cases to even 100 or more in untreated severe cases.

As a rule, death is rare until after frequent repetitive convulsions occur. Proteinurea and edema usually disappears within a week , the blood pressure returns to normal within 2 weeks.

In antepartum eclampsia, labour may begin spontaneously shortly after the convulsions and progress rapidly and in intrapartum eclampsia labour progresses rapidly with increased frequency and intensity of contractions

During convulsions, the placental blood flow decreases and this combined with maternal hypoxemia and lactic acidosis causes fetal bradycardia. However this usually recovers in 3 to 5 minutes, persistance of bradycardia for more than 10 minutes needs other causes like placental abruption to be ruled out. It is at time difficult to distinguish between postpartum eclampsia and postpartum cerebral vein thrombosis.

Management

"Toxaemia is said to be a disease of theories but also content that it is a disease of multiple inconsistent therapy regimens" – Zuspan [45].

Eclampsia is a life threatening emergency fraught with threat to both the maternal and fetal lives requiring aggressive 'intensive care' oriented line of management. FOGSI recommends that every maternity unit is equipped to deal with this obstetric emergency and institutes emergency management effectively.

The basic approach revolves around the following principles:

General Management

- Immediate care
- Maintain airway
- Maintain oxygenation
- Prevent trauma or injury

Treatment and Prophylaxis of Seizures

Management of hypertension

Obstetric management

Investigations

No single laboratory test or set of laboratory determinations is useful in predicting maternal or neonatal outcome in women with eclampsia. Investigations that are done to access the severity of pregnancy induced hypertension are:

- Hematological:- CBC.
- Urine for protein (Sheehan and lynch [46] 1973) microscopy.
- Coagulation profile.
- Biochemical: Blood urea, serum uric acid ,serum creatinine.
- Liver function tests.
- ABG / Serum electrolytes.
- Fundoscopy.
- Chest X ray.
- Doppler (Thaler [47] 1992).

The most common hematologic abnormality in obstetric disorders is thrombocytopenia, occurring in 17% of patients with eclampsia. Disseminated intravascular coagulation (DIC) appears to be common in patients with eclampsia.

Imaging Studies

Magnetic resonance imaging and Eclampsia

- Findings with MRI may be increased signal at the grey-white matter junction on T2-weighted images or cortical edema and hemorrhage.
- Abnormal findings have been reported in as many as 90% of women with eclampsia.

CT scan

Indicated in certain patients to exclude cerebral venous thrombosis, intracranial haemorrhage and central nervous system lesions.

Consider obtaining a CT scan of the head in patients:

1. Who have atypical presentations (such as seizures >24 h after delivery).
2. Who have been involved in a trauma.
3. Who are refractory to magnesium sulphate therapy.

Abnormalities can be observed in as many as one half of patients. Characteristic cortical hypodense areas, particularly in the occipital lobes and diffuse cerebral edema are thought to correspond to the petechial hemorrhages and diffuse edema noted in post-mortem.

Other Tests:

Cerebral spinal fluid studies and EEG rarely are useful in management; however, they may be indicated if epilepsy or meningitis is considered in the diagnosis.

General Management

Patients with eclampsia require nursing in specialized intensive care units with all necessary equipment.

Initial management: As with any seizure, the initial management is to clear the airway and maintain adequate oxygenation. The patient should be positioned in the left lateral position to help improve uterine blood flow and obstruction of the vena cava by the gravid uterus. The patient should be protected against injury during the seizure, i.e. the guard rails should be up on the bed, a padded tongue blade is placed between the teeth and secretions are suctioned from the patient's mouth.

Intravenous access: After the seizure has ended**,** 16- to 18-gauge intravenous line should be obtained for drawing specimens for laboratory studies and administering fluids. Intravenous fluids should be limited to isotonic solutions to replace urine output and about 700 ml /day to replace insensible losses.

The most important aspects of management is the maintenance of fluid balance. According to Sibai [34] (1999) fluid replacement should be at the rate of 60 ml per hour to a maximum of 125 ml per hour. Any overzealous infusion may precipitate pulmonary/cerebral edema (Sibai *et al* [48] 1987)

Control of the seizure: Do not attempt to shorten or abolish the initial seizure.

Monitoring: All patients should be monitored carefully the neurologic status**,** urine output**,** respiration**,** and fetal status . An indwelling Foley catheter should be placed in the bladder to help collect and record urine output.

Hypertension control: Blood pressure to be recorded every 10 minutes. Administration of antihypertensive medications to control blood pressure (diastolic 90-100 mm Hg)

Assessment of medical condition: Once the seizure is controlled and the patient has regained consciousness, the general medical condition is assessed. Induction of labour may be initiated when the patient is stable. Prophylactic antibiotic therapy is given to prevent infection.

Invasive monitoring: Pulmonary artery pressure monitoring may be necessary for accurate fluid management in eclamptic patients. This is particularly important in patients who have evidence of pulmonary edema or oliguria /anuria .

ANTI-CONVULSANT MANA GEMENT

Anticonvulsant drugs that are used include magnesium sulfate, phenytoin , diazepam, thiopental sodium and barbiturates.

Parenteral magnesium sulphate has emerged as the drug of choice for treating and preventing eclampsia with its major advantages of efficacy and relative safety to the mother / baby (Donald *et al*)[49] .

Although considerable controversies exists regarding indications, mode of action, safety and efficacy many large and significant studies over the years have validated the superiority of magnesium sulphate over the other drugs.

Magnesium is the fourth most common cation in the body and the second most common intracellular cation after potassium.

Horn suggested the use of magnesium sulphate in managing pre-eclampsia and eclampsia in Germany in 1906 who injected it intrathecally.

In 1925, Lazard [7] in Los Angeles and in 1926 Dorsett in St.Louis recommended the intravenous and intramuscular route of magnesium sulphate therapy. The use of magnesium sulphate for pre-eclampsia and eclampsia has been popular for over 80 years after this in the United States.

Pritchard gets the credit for popularizing magnesium sulphate for pre-eclampsia and eclampsia in modern obstetrics by his famous Parkland Hospital regimen popularly known as the ‘Pritchards regimen’. Others who made significant contribution to establish magnesium sulphate as the first line anti-convulsant in

eclampsia were Zuspan, Sibai, Duley, Flowers, Chesley and Pepper, Eastman and Cruik shant.

In 1985, The Collaborative Eclampsia Trial (CET) [50] found a lowered risk of recurrent convulsions with little difference in maternal, perinatal morbidity and mortality comparing magnesium sulphate with diazepam and phenytoin and concluded that "that there is now a compelling evidence in favour of magnesium sulphate rather than diazepam or phenytoin in treatment of eclampsia". Similar findings were also reported by Crowther et al in their study.

Friedman et al, Appleton *et al* [51] and Lucas *et al* in different studies established the superiority of magnesium sulphate over phenytoin validating its long practiced use.

Balla *et al* and Duley *et al* [52] compared magnesium sulphate with Lytic cocktail establishing its superiority and suggested the abandoning of Lytic cocktail.

In 2002 the results of the ' Magpie trial [15] ' another large multicentric trial was published which showed beyond any reasonable doubt the efficacy of magnesium sulphates in reducing the risk of Eclampsia.

The Cochrane review of 2002, which analyzed the data from most of the studies available on magnesium sulphate, has concluded magnesium sulphate as being superior to the other anti convulsants.

The practical advantages of magnesium sulphate which were highlighted in these studies were:

- Efficacy, reliability, ease of administration (phenytoin needs cardiac monitoring) easy nursing, predictable duration of action, wide safety margin, easy availability, cheaper, reactivity, less toxic and less depressive to the mother and the baby. Thus magnesium sulphate seems at present to be the most rational choice and the least likely to cause harm (CET).

Magnesium Sulphate

It is a chemical compound containing magnesium and sulphate, with the formula MgSO4. In its hydrated form the pH is 6.0 (5.5 to7.0). It is often encountered as the heptahydrate , MgSO4 7H2O, commonly called “Epsom salts”. It has a molecular weight of 246 and 1 g of the salt contains 98 mg of elemental magnesium. It has been called the forgotten mineral and the 5 cent mineral (in expensive). It is a simple compound having a wide range of therapeutic benefits in many other different conditions which include urolithiasis, mitral valve disorder, constipation, miscarriages, still borns, ischemic heart disease, diabetes, thyroid failure, asthma, blepharospasm, brittle bones, muscle spasm disorders and anxiety.

Availability

Magnesium sulphate is commercially available as 25% or 50% w/v, with 1 gram of Magnesium sulphate containing 98 mg of elemental ion**.**

MECHANISM OF ACTION

The precise mechanism of action of magnesium sulphate in eclampsia is not clear with a great deal of controversies still existing. The postulated mechanisms include

- Blockade of NMDA (N methyl D aspartate) subtype of glutamate channel receptor in a voltage dependant manner.

- Central action- preferential uptake by the hippocampus and cerebral cortex rich in NMDA receptors (Hallak [53] 1992 , Lipton and Resenberg [54] 1994) with potent cerebral vasodilatation demonstrated by Doppler (Belfort and Boise [55] 1992). Increased magnesium sulphate concentration were demonstrated in CSF after infusion (Thurnau *et al* [56]).

- Peripheral action - At the neuromuscular junction causing blockage of calcium entering the cell and blocking calcium at the intracellular sites & membranes, reducing the pre-synaptic acetylcholine release at the end plate, reducing the motor end plate sensitivity to acetylcholine (reducing neuromuscular irritability). Direct action of a neuromuscular block though suggested seems unlikely, as the serum concentration for its anticonvulsive action is well below that needed for neuromuscular block.

- Inhibits platelet activation.

- Decreases systemic vascular resistance.

- Increased level of EDRF receptors (Barton[57] 1992) and reduced plasma endothelin protects endothelial cell damage by free radicals.

- Mastrogiannis[58] et al (1992) showed raised renal and extra renal prostacyclin decreases angiotensin, renin levels, inhibits platelet activation, decreases systemic vascular resistance.

- Magnesium sulphate is a potent vasodilator especially in cerebral vasculature thus relieving cerebral vasospasm which is thought to be a cause for eclampsia, dilates the orbital vessels, increases cardiac output, increases renal blood flow, increases utero placental blood flow.

PHARMACO KINETICS

- The normal serum levels vary from 1.6 to 2.1 mEq/l.
- Only 0.3% of total body magnesium is found in serum, of which 33% is protein bound (mainly with albumin), 5% are complexed to anions like citrate and phosphates, and the remaining 62% is in ionized form.
- Magnesium is not absorbed orally, it attracts water in the colon (Basis for its use as a laxative).
- An IV dose of 4g magnesium sulphate causes an immediate elevation of magnesium level from normal to 7 to 9 mEq/I , subsequently due to intracellular transfer and renal elimination the concentration drops to 4 to 5 mEq/L by one hour. By about 90 minutes 50% of the infused magnesium move intracellular and by 4 hours about 50% are excreted in urine.
- Tubular reabsorption of magnesium depends on Parathyroid hormone level.
- Magnesium administered parenterally promptly crosses the placenta and achieves equilibrium in the fetal serum and less in the amniotic fluid (Pritchard [59] 1979)
- The kidneys excrete magnesium.
- Calcium is the physiological antidote for magnesium.

Therapeutic levels to prevent convulsions from different studies

REGIMEN	**Therapeutic levels (mEq/l)**
Pritchard	4.8 – 8.4
Zuspan	3 – 4
Chesley and Tepper	4 – 7
Cruink shant	3.3 – 4.47
Eastman	3 – 6
Hall, Anderson and Herbert	6– 8

- Duley *et al* [60] (1994) in his study used clinical evaluation alone and showed that the there is no need to check serum magnesium levels. Estimation of magnesium levels are useful in the management of treatment failures.

MAGNES1UM SULPHATE TOXICITY

"Consider magnesium sulphate a dangerous drug" - Zuspan.

Magnesium sulphate is not an innocuous drug, so strict monitoring of patients on magnesium sulphate is needed to prevent serious side effects to mother / fetus.

Maternal side effects includes:

Disappearance of patellar reflex is the first sign of impending toxicity (8-10 mEq/l).

- Dry mouth, flushing, drowsiness, blurred vision, slurred speech, nausea, vomiting (9-12 mEq/l).
- Cardiotoxicity - prolonged PR, QT, QRS (10-15 mEq/l).
- Respiratory depression / paralysis (12 mEq/1).
- Cardiac arrests (30 mEq/l).

Fetal effects are

- **Many conflicting data are available**
- Neurological , neuromuscular depression (Lipsitz ,English [61] 1967).
- Protective effect against cerebral palsy (Nelson and Grethin [62] 1995).
- Hyporeflexia.
- Decreases FHR variability (Pritchard [59]1979, Schneider [63] 1994).
- No effect on BPP (Gray *et al*), no neonatal compromise (Pritchard *et al* 1984).

- Low Apgar score.
- Nasocomial infections, neutropenia (Mouzinho [64] 1992 , Nash [65] 1992).
- Disturbed fetal calcium hemostasis (Smith *et al* [66] 1992).

ROUTE OF ADMINISTRATION

- Sibai et al [67] 1984 found no therapeutic advantages of intravenous over intramuscular administration except for avoidance of muscle pain.
- Intravenous dose is always diluted because bolus may cause cardiac arrhythmia/ arrest.

Other uses of Magnesium sulphate

Magnesium sulphate in cardiology

1. In myocardial infarction-protects from reperfusion injury.
2. Arrhythmia's-both atrial and ventricular.
3. Preoperative prophylactic in cardiac surgery.
4. Rheumatic heart disease.

Magnesium sulphate in anesthesia: Complementing other conventional neuromuscular blockage drugs and in preventing postoperative shivering.

Other Uses

- Treatment of respiratory failure.
- In neonatal pulmonary hypertension / tetanus.
- Renal stones.
- Abortions, stillbirths, premenstrual syndrome.
- Diabetic / thyroid disorders.
- Migraine.
- Blepharospasm.
- Anxiety disorders.

Contraindications: Documented hypersensitivity**;** heart block**;** Addison disease**;** myocardial damage; severe hepatitis; or myasthenia gravis.

- Management of magnesium sulphate toxicity is by calcium. Calcium is the logical antidote for magnesium. Intravenous calcium as 10 ml of 10% calcium gluconate infusion is given slowly over three minutes. It increases the acetylcholine liberated at the neuromuscular junction by the action potential.
- If respiratory arrest ensues prompt endotracheal intubation and ventilation are life saving (Mc Cubbin *et al* [68] 1981)

Different magnesium sulphate regimens

Over the past 70 years of the use of magnesium sulphate in pregnancy various regimens have been described and widely disseminated. The widely accepted of them being:

Pritchard gets the credit for popularizing magnesium sulphate for eclampsia / pre-eclampsia in modern obstetrics. In 1955, he initiated the parkland hospital eclampsia protocol which came to be popularly known as the 'Pritchard regimen'.

Loading dose

- 4 g (20 ml of 20%) IV over not less than 3 minutes to be immediately followed by 10 g (20 ml of 50%) IM in each buttock.

Maintain dose

- 5gms (10 ml of 50%) is given every 4 hours at alternate sites after assuring.
- Presence of knee reflex.

- Respiratory rate > 14/min.
- Urine output >100 ml.
- Treatment is discontinued 24 hours after delivery.
- If convulsions persist after 15 min 2gms (10 ml of 20%) is given over 2 min ,if women is large 4gms is given.

Pritchard published his findings in 1984 in the American journal of obstetrics and gynecology, included study group of 245 patients. There was one maternal death in the series and perinatal mortality was 15.4 %. Time interval between onset of convulsions and delivery varied from 3-51 hours. 66 % of the cases had vaginal delivery.

Sibai's Regimen

Baha. M. Sibai [12] at the University of Tennessee introduced guidelines for IV Magnesium sulphate administration.

Loading	**Maintenance**
• 6g IV (30 ml of 20%) in 100 ml of 5% dextrose over 10-15 minutes.	• (20g of 50%) added to l000ml of 5% dextrose given as IV infusion at 100 ml per hour (2g per hour). Adjust to get a serum magnesium level of 4.8-9.6 g/dl.

Dosing schedule of other regimen

	Loading	**Maintenance**
Zuspan F.D	4g IV over 5-10 hours	1-2g/hour as IV infusion
Charles flowers	4g IV in 250 ml of 5% D	5g every 4-6 hrs as IM
Eastman	10g given as IM	5g / hour given as IM
Chesley - Tepper	3g given as IV and 10 g as IM	5g / hour given as IM
Hall, Anderson and Herbert	2% MgSO4 at 140 drops/min in the first hour, 80 drops/min in the second hour, 40 drops/min in the third hour	
Cruink shant et al	4g given as IV	2g/ hour as IV
Suman sardesi	4 g IV	2 g IV every 4^{th} hourly
Dhaka regimen	10g – 4 g IV ,3 g IM in each buttock	2.5 g IM in each buttock 4^{th} hourly.

Need for lowering the dose

In our country Pritchards regimen has been modified in various places, though there have been no standardization of the protocol or long term statistical data collection. In CET magnesium sulphate was given in a low dose of only 1gm/hr.

In February 1997 at the World Congress Labour and Delivery, Suman Sardesai [14], from the VM Medical College, Sholapur presented the paper` low dose magnesium sulphate regimen due to low weight of the patients and the need for tailoring the dose and formulating a new regimen was emphasized.

She published a review of 69 cases with 8.7% recurrence rate, 2.5% maternal mortality, 35.95% perinatal mortality, with results from established regimen in 2003 the updated results were published with

- Recurrence rate of 7.89%.
- Maternal mortality rate of 2.63%.
- Perinatal mortality rate of 33.98%.

Begum R *et al* [69] in 2001 used a low dose (Dhaka) Magnesium Sulphate regime for eclampsia , and concluded that Half of the standard dose of magnesium sulphate appeared to be sufficient to control convulsions effectively and serum levels of magnesium remained lower than levels which produce toxicity.

DHAKA REGIMEN OF MAGNESIUM SULPHATE REGIMEN:

Loading Dose:

- 4gms of magnesium sulphate given intravenously slowly over 15 minutes.
- 3gms given intramuscularly in each buttock.

Maintenance Dose

- 2.5gms every 4 hours given intramuscularly in alternate buttocks, until 24hrs after administration of the first dose.
- Monitored with urine output, knee jerk, and respiratory rate.

Begum MR, Begum A, Quadir E studied Loading dose versus standard regime of magnesium sulfate in the management of eclampsia and concluded that there was significant reduction in recurrent seizures when using only a loading dose as opposed to the standard regimen. The seizure rates were 3.96% in loading versus 3.51% in standard regimen. Magnesium toxicity is unlikely with these regimens and levels do not need to be routinely measured.

"More patients die of Magnesium sulphate toxicity than from the seizures especially in the developing countries where disciplined use is hard to achieve, there is definitely a transnational difference in response to Magnesium sulphate in the third world with racial characteristics being important in determining the response, there is danger in applying the results of the trials as such in different countries "- Sibai.

Results from the Magpie trial suggested that a shorter course of treatment may be adequate with most of the woman probably receiving only the loading dose and showing no difference in outcome being compared to those given further Magnesium sulphate.

The fact that eclampsia can occur any time upto 7 days after the delivery and all regimens being given only for a maximum of 48 hrs, patients with the low sub therapeutic levels after stopping these regimen show no seizures during those days asks for further reduction in both the dosage and its frequency.

OTHER ANTI-CON VULSANTS USED IN ECLAMPSIA

1. DIAZEPAM

This benzodiazepine compound was introduced and popularized by Lean *et al* [11] Mechanism of action – by depressant action on CNS, increasing the seizure threshold and facilitates the inhibitory action of GABA.

DOSE:

Loading dose 10mg slow IV over 2 minutes, repeated if convulsions recurred - followed by IV infusion of 40 mg in 500 ml NS for 24 hrs, titrated against the level of consciousness with the aim to keep the woman sedated but arousable. During the next 24 hrs an infusion of 20mg diazepam in 500 ml NS was given.

Side effects are

- Respiratory depression, risk of aspiration pneumonia due to prolonged sedation.
- Aspiration, loss of beat to beat variability, heart rate variations, neonatal respiratory depression, hypothermia, hypotonia and poor suckling (FLABBY BABY syndrome)

2. PHENYTOIN

Although introduced in treatment way back in 1938, its use in eclampsia was noticed an 1987, its a drug recommended only for prevention and not for treatment of convulsions

Mechanism of action

- Membrane stabilizing effect on neuronal membranes.
- Sodium concentration is reduced- reducing activity.
- GABA concentration is increased- inhibiting activity.

DOSE:

There is no consensus about an ideal dose. Different regimens are followed.

Initial dose: l gm IV by slow infusion over 20 minutes (with cardiac monitoring by ECG), followed by 100 mg every 6 hourly for next 24 hours.

Important side effects:

- Phlebitis at site.
- Peripheral neuropathy.
- Blood dyscrasias.
- Megaloblastic anemia.
- Cardiac dysarrythmia, cardiovascular collapse, hypotension and sever CNS depression at high rates of infusion.

Many studies conducted lately have however established the superiority of magnesium sulphate over phenytoin in eclampsia , the notable among these being the CET and the Parkland study by Lucas *et al*.

OTHERS

- The Lytic cocktail – Chlorpromazine, Promethazine and Pethidine introduced by sheers, popularized in India by Dr. Krishna Menon [8] in 1961.
- Barbiturates.
- Sodium thiopental especially in status eclampticus.

ANTI HYPERTENSIVE MANAGEMENT

The philosophy of anti hypertensive treatment in Pre-eclampsia and Eclampsia is to prevent complications like maternal cerebrovascular accidents and heart failure. Considerable reduction in maternal mortality have been achieved with the use of antihypertensives , the best antihypertensive agent, when to start and the dosage to be used varies (Magee *et al* 1999).

The commonly used drugs have been Hydrazine, Labetolol, Nifedipine, Sodium nitroprusside, Diazoxide, Nitroglycerine, Verapamil and Methyldopa.

HYDRAZINE

- Most widely accepted
- Used to treat severe and uncontrolled hypertension

Route	Dosage	Action	Onset	Side Effects
IV bolus or Infusion or IM	5 mg IV bolus, 5mg incremental doses every half hourly Maximum 20 mg	Arteriolar dilatation	10-30min	Headache, vomiting, Hyperreflexia, tachycardia, increased cardiac output, ICT and FHR changes (Sibai 1987 Butters et al 1990).

- Is far away from a ideal first line drug, Labetolol and Nifedipine are found to be superior (Magee *et al* 1991).

LABETOLOL

- A drug with many theoretical advantages, most of them not proven in clinical setting one example of which is its alpha adrenoreceptor blockade action.

Route	Dosage	Action	Onset	Side Effects
IV bolus or Infusion	20 mg IV bolus - if not effective, 40 mg after 10 minutes, if not effective 80 mg after another 10 minutes. Max -220 mg.	Combined alpha and alpha beta blocker	5 min	Headache, palpitations, tachycardia.(El Qarmalavi *et al* 1995)

NIFEDIPINE

Is an established first line antihypertensive agent in pregnancy (Allen et al 1987), Constantine et al [70] 1987, Greer et al 1989).

Route	**Dosage**	**Mode of action**	**Onset of action**	**Side Effects**
Sublingual or Oral	10 mg every 15-30 minutes until DBP falls to 110mmHg Maximum dose-l80 mg	Calcium channel block- vasodilatation. Inhibit platelet aggregation, improves uteroplacental blood flow	Sublingual: 1-5 min peak- 20-30 min, Oral : 10-15 min, Slow release preparations: 60 minutes	Flushing, headache palpitations, hypotension, tachycardia, edema, syncopes, warm sweaty extremities

- Reduces maternal blood pressure in initial stages of pregnancy .
- Diminishes blood pressure, proteinuria, improves renal function .
- Sublingual can substitute parenteral therapy .
- Prevents erythrocyte aggregation .

METHYL DOPA

- Most extensively studied drug for treatment of pregnancy induced hypertension (Cockburn et al [71] 1986).
- Favourable efficacy and safety profile.
- Used for chronic therapy.
- Drawback is the frequency of side effects including tiredness, dizziness, depression, flushes, headache, vomiting, palpitations.
- Dosage is 250- 500 mg in three divided doses to a maximum of about 2 g /day.

NIMODIPINE

Selective effect on cerebral circulation with encouraging results (Belfort et al[72] 2003).

NICARDIPINE

Selective action on peripheral vasculature with lesser ionotrophic effect and tachycardia (Carbonne et al [73] 1993).

VERAPAMIL

Given as IV infusion 5-10mg/hr (Belfort et al [74] 1990)

ACE INHIBITORS

Fetal side effects include defective skull ossification, Oligohydramnios, Neonatal anuria (Piper et al[75] 1992).

NITROPRUSSIDE

Recommended in Hydralazine, Labetolol and Nifedipine resistant cases. Side effect is Cyanide toxicity.

DIURETICS

Only if evidence of Pulmonary edema, Congestion (Cunningham [76] 1993).

KETANSERIN

Selective seratonin receptor blocker.

NITROGLYCERINE

Combined arteriolar and venous but predominantly a venous dilator given as continuous infusion.

Obstetric Management

Delivery of the fetus and the placenta is the only ultimate cure of eclampsia.

Delivery should be well planned, well done on the best day, in the best place, in the best way and by the best team (Walker ,J J [77] 2000). Once eclampsia has set in one must weigh maternal well being over fetal well being and take decisions.

Gestational age needs to be ascertained and assessment with a cardiotocograph may be desirable. If the woman is in labor, continuous electronic fetal heart rate monitoring is recommended. In settings where this is not possible regular auscultation of FHS especially during and after a contraction is recommended to pick up late decelerations. If Conservative management is planned then assessment of the fetus with Ultrasound – fetal weight, amount of liquor and Doppler studies can be done. Serial assessment can optimize the timing of delivery.

Definitive treatment of Eclampsia is delivery.

Vaginal delivery / LSCS – would depend on obstetric evaluation of individual patient. The definitive treatment of eclampsia is delivery. Attempts to prolong pregnancy in order to improve fetal maturity are unlikely to be of value.

However, it is inappropriate to deliver an unstable mother even if there is fetal distress.

Once seizures are controlled, severe hypertension treated, and hypoxia corrected, delivery can be expedited. Vaginal delivery should be considered but caesarean section is likely to be required in primigravida remote from term with an unfavourable cervix. Vaginal prostaglandins increase the success of induction and

augmentation. Hypertension monitoring and control should continue vigilantly throughout labour. If the fetus is premature, convulsions are absent and maternal health stable - delivery can be delayed. In this time, corticosteroids should be given.

Vaginal Delivery

Principles – Second stage of labour should be short and elective operative vaginal delivery can be considered. Pain relief is desirable.

LSCS is considered for any obstetric indication; fetal distress, or if vaginal delivery is unlikely to occur within a reasonable time frame the first Eclamptic fit.

If LSCS is decided upon in an eclamptic case then the next MgSO4 dose (after 4 hours) may be deferred, since it may increase chances of accentuating the action of muscle relaxants, and uterine atony. It is also apparent that a 'magic cure' did not immediately follow delivery by any route. The timing of delivery affects both the mother and the baby with both a' too hurried' a delivery and 'too late' a delivery being dangerous.

Anaesthesia.

In the absence of coagulopathy Epidural anaesthesia is the ideal. General anaesthesia can be hazardous in patients with laryngeal edema making intubation difficult and the procedure may provoke extreme hypertension and cerebrovascular complication.

For labour analgesia injection pethidine IM or IV or promethazine can be used. Second stage of labour is to be shortened with forceps or vacuum extraction.

Ergometrine is avoided as prophylaxis for postpartum hemorrhage because it aggravates the hypertension.

Postpartum monitoring is very important because a majority of mortality occur in the immediate postnatal period. So careful monitoring of the vitals with attention to fluid electrolyte balance and nutrition is undertaken.

Antihypertensives are continued. Persistent hypertension or convulsions after 48 hrs need further evaluation to rule out other disorders. Methyldopa is avoided, as depression is its side effect, ACE inhibitors can be safely used.

Follow up

The diagnosis of hypertension in pregnancy is not fully confirmed until after the pregnancy is over, it is therefore important to follow up the patient until blood pressure returns to normal. If it does not further evaluation becomes mandatory.

Patient is seen weekly until blood pressure returns to normal.

Postpartum counseling regarding education of the patients about the disease, preventive aspects and advice regarding the future pregnancies and explaining the risks of recurrence are done.

Complications of Eclampsia

- Cerebral haemorrhage, Cerebral edema, Raised ICT, Encephalopathy.
- Psychosis.
- Hyperpyrexia.
- Pulmonary oedema, Respiratory failure, Aspiration.
- Cardiac failure, Coagulopathy.
- Retinal detachment, Papilloedema, Blindness.
- Hepatic rupture, HELLP syndrome, Hepatic failure.
- Abruption.
- Fetal-prematurity, Asphyxia.
- Oliguria, Acute Renal Failure.

Long-term Consequences of Eclampsia.

Women with pregnancy induced hypertension have an increased risk of hypertension in later life. As many as 56% of patients with eclampsia may have transient deficits, including cortical blindness. Formerly eclamptic women had subjectively impaired cognitive functioning. They later reported preliminary evidence that women with multiple seizures had impaired sustained attention compared with contemporaneous normotensive.

Most women do not develop long-term sequelae from eclamptic seizures, but their cases should be followed closely for resolution of symptoms. Maternal, as well as fetal, death can be a consequence of eclampsia and its complications.

Recent studies also report an increased incidence of Ischemic Heart Disease (Jonsdottir et al [78] , 1995, Humphries et al [79] 1999)

A case of Eclampsia according to Sibai et al (1992) has a 19.5% possibility of having mild Pre-eclampsia in the next pregnancy, 25.9% possibility of having severe Pre-eclampsia in the next pregnancy , 1.4% possibility of having recurrent Eclampsia in the next pregnancy.

Chesley published data collected over 44 years in 1978 showing that pregnancy induced hypertension recurred in 33.8% of cases, of which 40% were mild and 60% severe , in which 21 % had eclampsia.

Women having eclampsia before 30 weeks had a higher recurrence. Multiparas developing eclampsia had high prevalence of chronic hypertension than do nullipara (Chesley).

Maternal Mortality.

About 210 million women become pregnant every year around the world and every minute one pregnant woman dies. Pre- eclampsia / Eclampsia continues to remain a major cause of maternal deaths in both the developing and developed countries more so in the former due to the deficient antenatal care. Varied Mortality Rates have been reported (1% - 13.5%).

perinatal mortality.

Varies from 30-60% . Different incidences reported by various studies were

5% (Sibai [80]), 15.7% (Pritchard)

224-307 of live births (CET [50]), 13% (Magpie [15])

17% (Mood ley [81]) , 11% (Coetzee et al [82]).

SOURCE OF DATA:

All pregnant women with Imminent eclampsia (hypertension with headache, epigastric pain, vomiting and blurring of vision) & eclampsia who are admitted/ referred to BLDE University's Shri B M Patil Medical College , Hospital & Research Centre.

DETAILS OF THE STUDY:

INCLUSION CRITERIA:

- All cases of imminent eclampsia (hypertension with headache, epigastric pain, vomiting and blurring of vision)
- All cases of eclampsia (Antepartum / Intrapartum / postpartum).

EXCLUSION CRITERIA:

Other cases of convulsions like epilepsy, cerebrovascular accidents, rupture of aneurysm, meningitis, encephalitis, cerebral tumors, hyperventilation syndrome.

- Patients already treated outside with magnesium sulphate.

- Those who were deeply unconscious with CVA, renal failure (severe oliguria or anuria), massive pulmonary edema, associated massive hemorrhage, DIC and shock (including sepsis).

- Hypersensitivity to magnesium sulphate.

METHOD OF COLLECTION OF DATA:

METHODOLOGY :

All cases of eclampsia (Antepartum / Intrapartum / postpartum) and Imminent eclampsia (hypertension with headache, epigastric pain, vomiting and blurring of vision) will be included in the study

Cases are divided into two groups , **Group I (control) patient's will receive magnesium sulphate by Pritchard regimen and Group II (Study) patients will receive 10 gm i.m. single loading dose magnesium sulphate . Equal number of cases are allotted into Group I and Group II according to randomization table baring a seed number 29254.**

Primary outcome measures will be the occurrence of fits in those with imminent eclampsia & further convulsions in patients of eclampsia. Secondary outcome measures will be maternal outcome & fetal outcome (APGAR at 5min of birth & duration of NICU stay).

SAMPLING:

Study period from: October 2013 to May 2015.

All the patients admitted during this period, who will fulfill the inclusion criteria, will be included in this study.

The sample size is 167(approx. 168)

Formula used to calculate the sample size is

$$n = [(z_\alpha + z_\beta)^2 \times 2 \times s^2]/d^2$$

$z_{\alpha-z}$ value for α level

$z_{\beta-z}$ value for β level

S – SD of APGAR score

d – Difference between average group value.

Hence, 84 cases of each will be included in each group

INVESTIGATIONS / INTERVENTIONS:

1. BLOOD INVETIGATIONS:

- CBC:
- BLOOD GROUPING AND TYPING:
- BT:
- CT:
- RBS:

2. PT , INR:
3. URINE ROUTINE:
4. BLOOD UREA , SERUM CREATININE & URIC ACID:
5. LFT
6. NON STRESS TEST
7. FUNDOSCOPY
8. OBSTETRIC ULTRASOUND SCAN: (if necessary)

ANTI CONVULSANT LINE OF MANAGEMENT

1. **PRITCHARD REGIMEN OF MAGNESIUM SULPHATE REGIMEN**

4gms of magnesium sulphate (Mgso4, 7H2o, USP) as a 20% solution intravenously at a rate not to exceed 1gm/min. Follow promptly with 10gm of 50% magnesium sulphate solutions 5gms deep IM in each buttock. 5gms of 50% solution of magnesium sulphate was given every 4hours thereafter for 24 hours provided,

a) Patellar reflex is Present.

b) Respiratory Rate > 12/min.

c) Urine output > 30ml/ hour.

2. **SINGLE DOSE OF MAGNESIUM SULPHATE REGIMEN:**

- 5gms MgSo4 50% solution given intramuscularly in the upper and outer quadrant of both the buttocks.
- Monitored with urine output, knee jerks, and respiratory rate.
- If convulsion recurred anytime after admission of single dose, it is switched over to standard Pritchard regime.

Anti Hypertensive Line of Management:

Control of hypertension achieved by T. Nifidipine 10mg thrice and T.Labetelol 100mg bid daily. Once BP is controlled with it, after 48hrs dose was tapered.

Obstetric Management

After stabilizing the patient, a detailed obstetric examination was done. Mode of termination was planned according to the gestational age, viability of the fetus, and the cervical scoring.

After delivery, the patient was observed carefully for 48 – 72 hours in the labour ward and post operative ward and followed up till the discharge of the patient.

Outcome Measures:

Primary outcome measures will be the occurrence of fits in those with imminent eclampsia & further convulsions in patients of eclampsia. Secondary outcome measures will be maternal outcome & fetal outcome (APGAR at 5min of birth & duration of NICU stay).

RESULTS

Table 1: Percent Distribution of Age among Group I and II

Age (Yrs)	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
<=20	26	31.0	28	33.3	54	32.1	0.640
21-25	39	46.4	42	50.0	81	48.2	
26-30	18	21.4	14	16.7	32	19.0	
>30	1	1.2	0	0.0	1	0.6	
Total	84	100.0	84	100.0	168	100.0	

Age of women in the two groups does not differ significantly (p value > 0.05). In this study, In group I, 26 cases (31%) were below 20 years, 39 cases (46.4%) were 21-25 years, 18 cases (21.4%) were 26-30 years, 1 case (1.2%) above 30 years.

In group II, 28 cases (33.3%) were below 20 years, 42 cases (50%) between 21-25 years, 14 cases (16.7%) were 26-30 years, 0 cases (0%) were above 30 years.

FIGURE 1 : Age Distribution

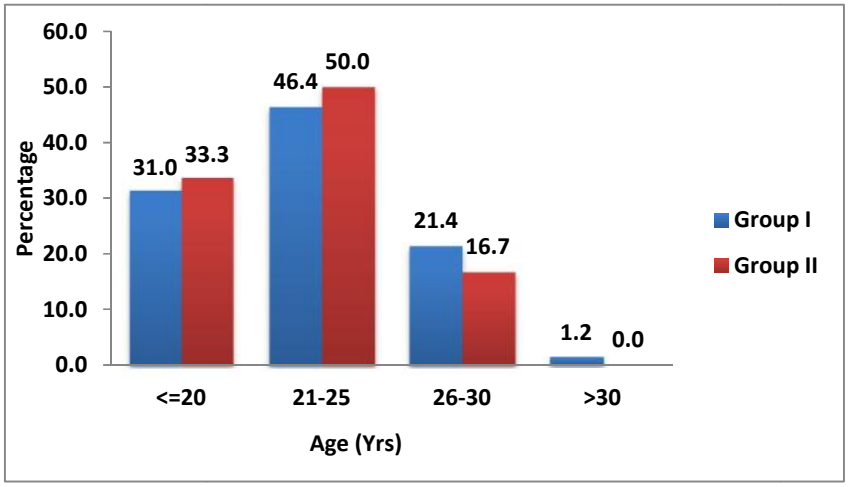


Table 2: Percent Distribution of Gravidity among Group I and II

Gravidity	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
Primigravida	56	66.7	62	73.8	118	70.2	0.311
Multigravida	28	33.3	22	26.2	50	29.8	
Total	84	100.0	84	100.0	168	100.0	

Gravidity in the two groups does not differ significantly. In group I primigravida 56 (66.7 %), 28 cases were multigravida (33.3%). In group II primigravida 62 (73.8%), multigravida 22 (26.2%). The P Value being > 0.05 which is not significant

Figure 2: - Gravidity

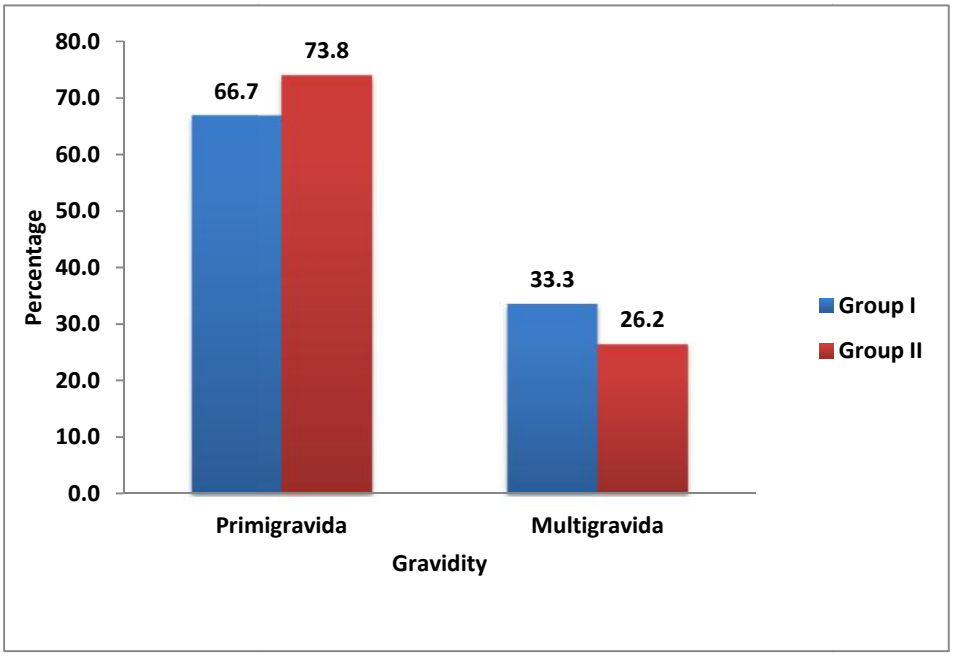


Table 3 : Percent Distribution of Past h/o PIH among Group I and II

Past h/o PIH	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
Absent	66	79.5	65	77.4	131	78.4	0.723
Present	17	20.5	19	22.6	36	21.6	
Total	83	100.0	84	100.0	167	100.0	

In our study In group I, 17 cases (20.5%) had h/o PIH ,in group II 19 cases (22.6%) had h/o of PIH . P value being >0.05 with is not significant.

Figure 3: Past history of PIH

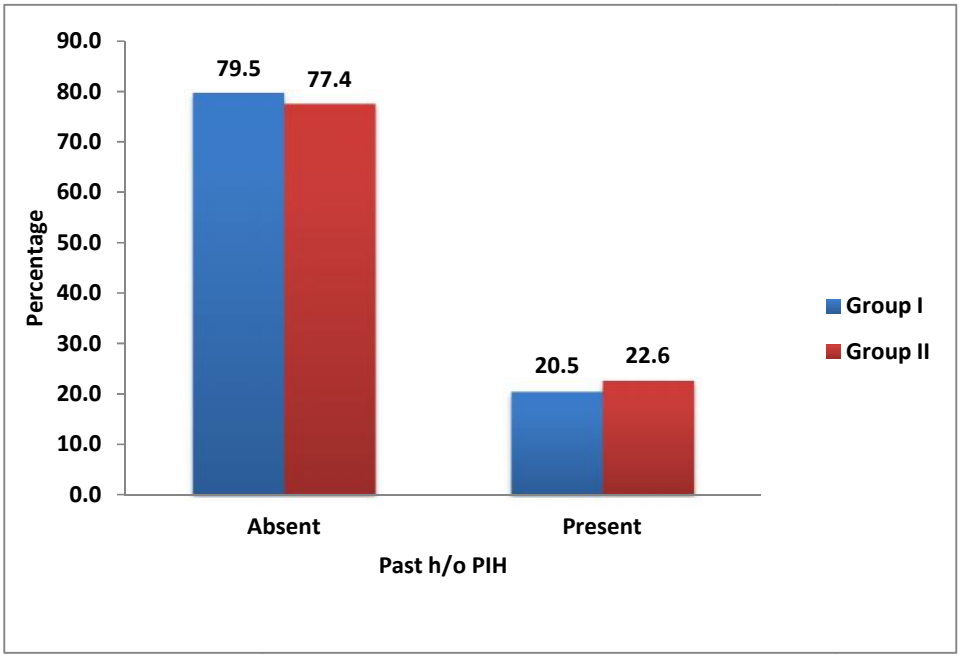


Table 4: Percent Distribution of Gestational age among Group I and II

Gestational age (Wks)	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
≤ **28**	4	4.8	1	1.2	5	3.0	0.210
29-32	4	4.8	7	8.3	11	6.5	
33-36	29	34.5	21	25.0	50	29.8	
>36	47	56.0	55	65.5	102	60.7	
Total	84	100.0	84	100.0	168	100.0	

In our study, In group I , 4 cases (4.8%) were ≤ 28 week gestation, 4 cases (4.8%) were 29-32 weeks , 29 cases (34.5%) were 33 to 36 weeks and 47 cases (56%) were > 36 weeks size.

In group II , 1 case (1.2%) was ≤ 28 weeks gestation, 7 cases (8.3%) were 29-32 weeks , 21 cases (25%) were 33-36 weeks, 55 cases (65.5%) were > 36 weeks size.

The mean gestational age of group I is 36.5 weeks and group II is 37 weeks. The p value is >0.05 which is insignificant.

Figure 4: gestational age (wks)

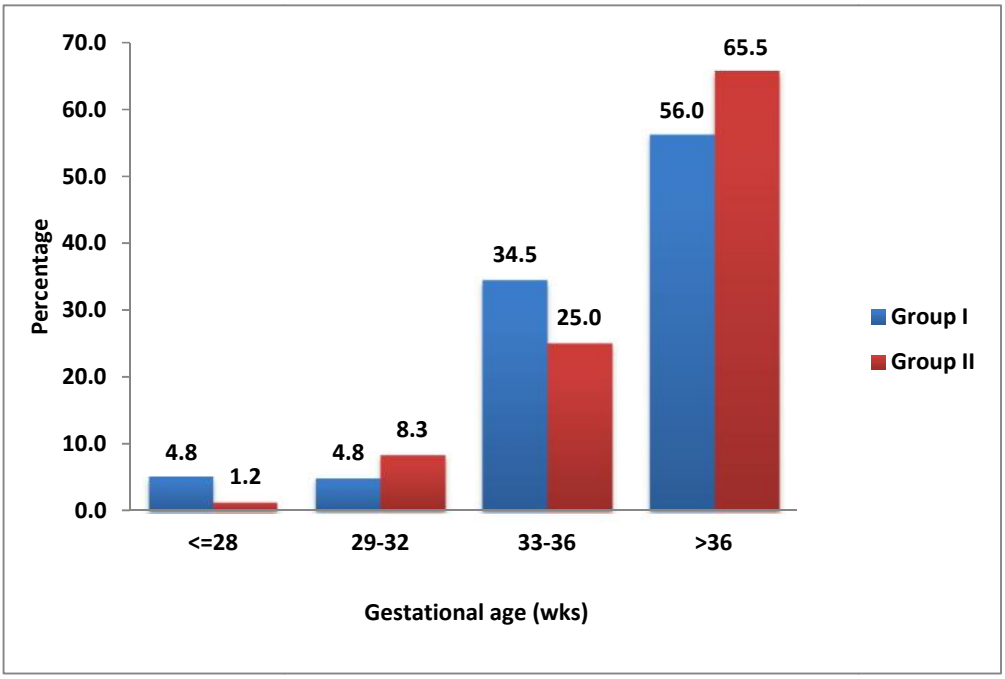


Table 5: Mean Gestational age among Group I and II

		Min	Max	Mean±SD	p value
Gestational age (wks)	**Group I**	25	43	36.5±3.5	0.601
	Group II	27	42	37.0±2.9	

Figure 5: Mean gestational age (wks)

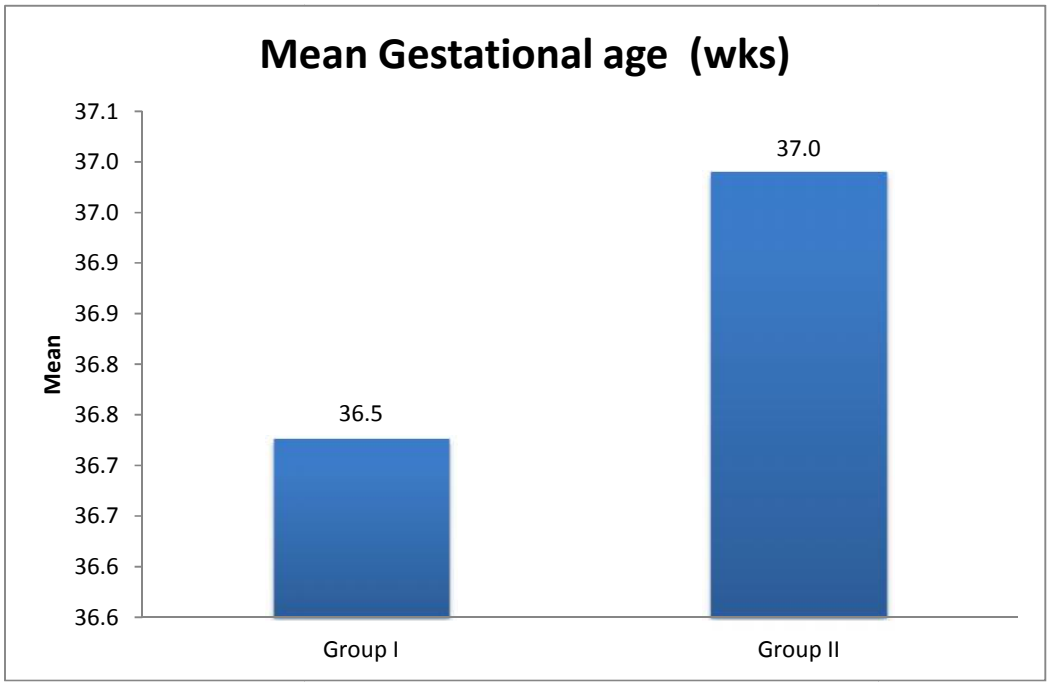


Table 6 : Percent Distribution of Antenatal care among Group I and II

Antenatal care	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
Booked	81	96.4	80	95.2	161	95.8	0.699
Unbooked	3	3.6	4	4.8	7	4.2	
Total	84	100.0	84	100.0	168	100.0	

In group I , 81 (96.4%) were booked cases , 3 cases were unbooked (3.6%). In group II , 80 (95.2%) were booked cases, 4 (4.8%) were unbooked cases .

P value being >0.05 which was not significant.

Figure 6 : Antenatal care

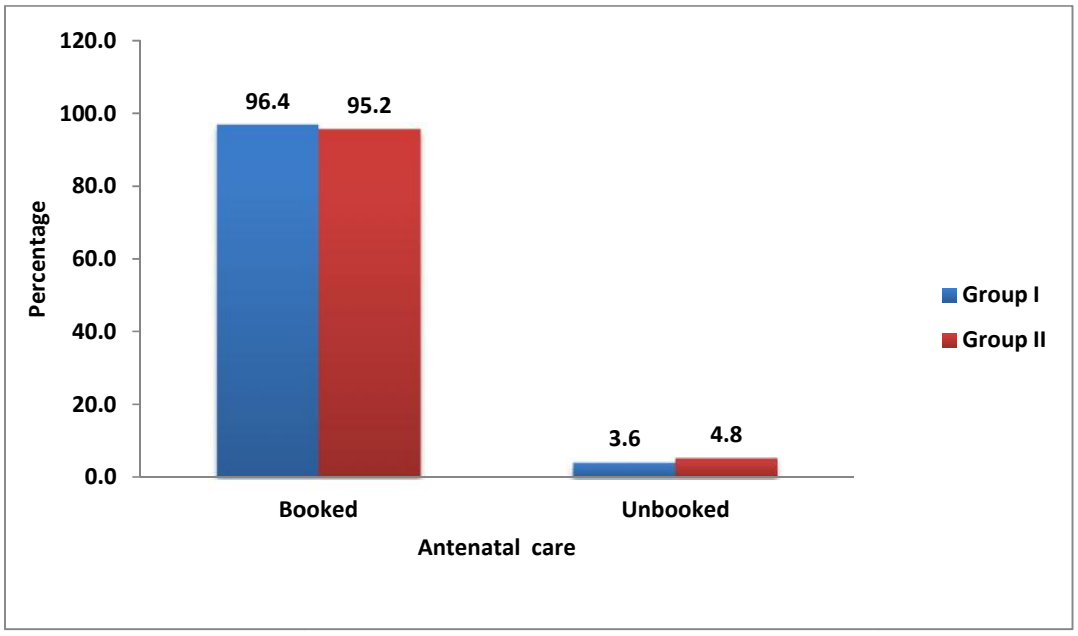


Table 7 : Percent Distribution of Premonitory -signs among Group I and II

Premonitory -signs	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
Absent	6	7.1	7	8.3	13	7.7	0.773
Present	78	92.9	77	91.7	155	92.3	
Total	84	100.0	84	100.0	168	100.0	

In our study , In group I, 6 cases (7.1%) did not have premonitory symptoms and 7 cases (8.3%) in group II. 78 cases (92.9%) in group I and 77 cases (91.7%) in group II had premonitory symptoms .

Majority of the patients in both the groups had premonitory symptoms.

The p value is >0.05 which is insignificant.

Figure 7 : premonitory signs

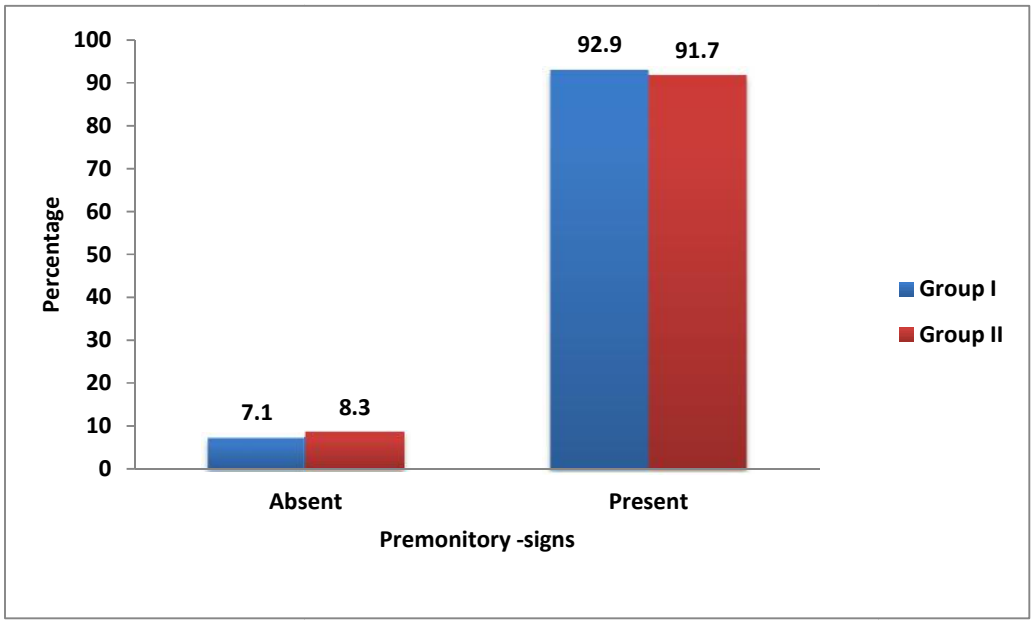


Table 8 : Percent Distribution of No of convulsions among Group I and II

No of convulsions	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
1-5	25	73.5	22	84.6	47	78.3	0.301
6-10	9	26.5	4	15.4	13	21.7	
Total	34	100.0	26	100.0	60	100.0	

In our study, In group I , 25 cases (73.5%) had 1-5 Episodes of convulsions, 9 cases (26.5%) had 6-10 episodes of convulsions.

In group II , 22 cases (84.6%) had 1-5 episodes of convulsions, 4 cases (15.4%) had 6-10 episodes of convulsions. P value being is not significant.

Figure 8 : No of convulsions

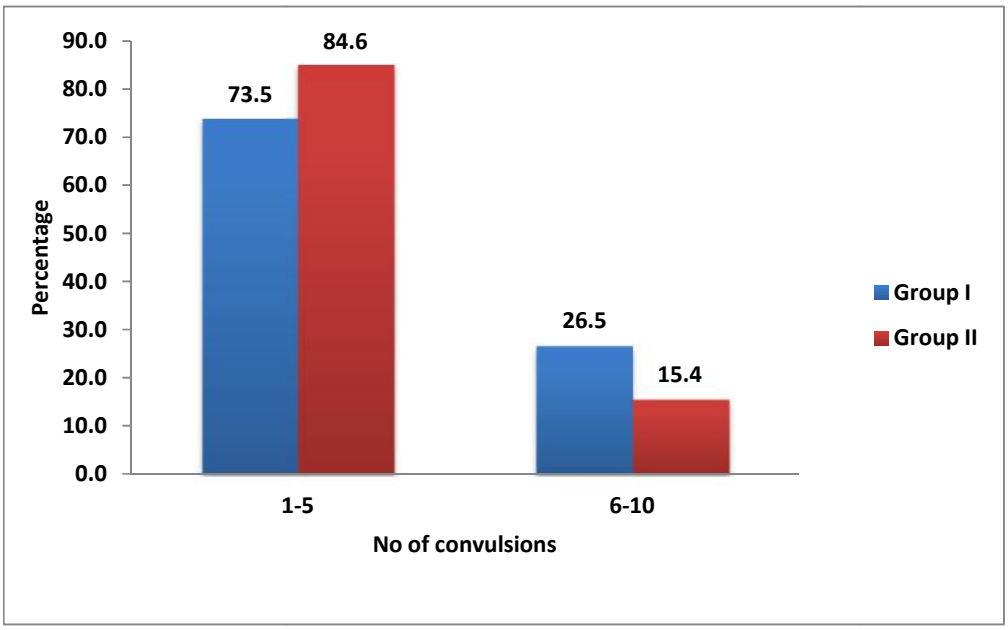


Table 9 : Percent Distribution of type of eclampsia among Group I and II

Type of eclampsia	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
APE	25	29.8	20	23.8	45	26.8	0.231
IE	49	58.3	57	67.9	106	63.0	
IPE	7	8.3	2	2.4	9	5.4	
PPE	3	3.6	5	6.0	8	4.8	
Total	84	100.0	84	100.0	168	100.0	

In our study, In group I, 25 cases (29.8%) were antepartum , 49 cases (58.3%) were imminent eclampsia, 7 cases (8.3%) were intrapartum, 3 cases (3.6%) postpartum. In group II, 20 cases (23.8%) were antepartum, 57 cases (67.9%) were imminent eclampsia , 2 cases (2.4%) was intrapartum, 5 cases (6%) postpartum cases. P value being >0.05.

Figure 9: Type of eclampsia

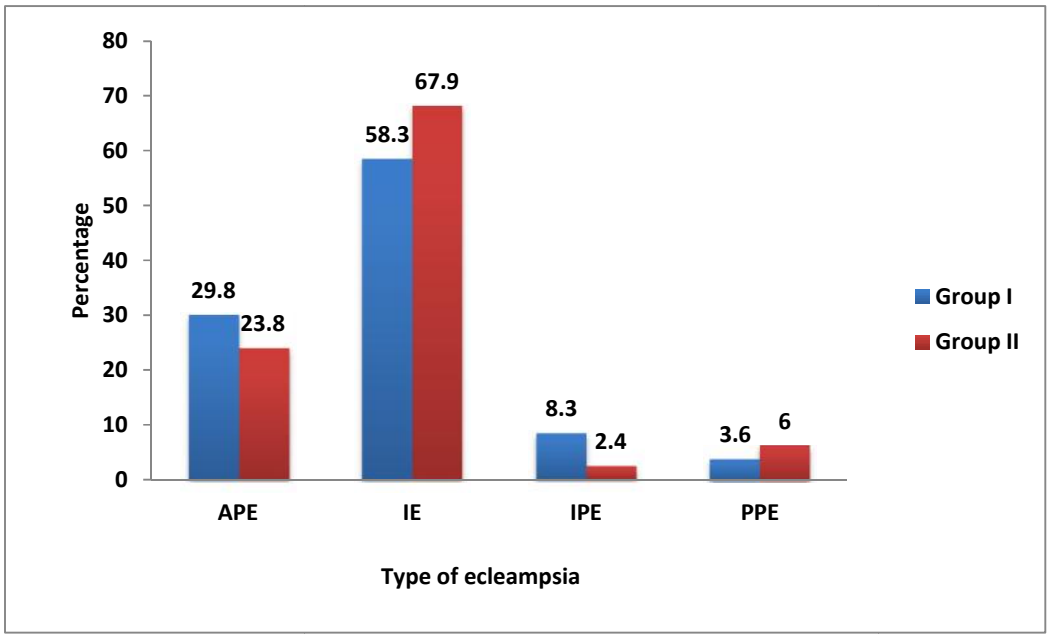
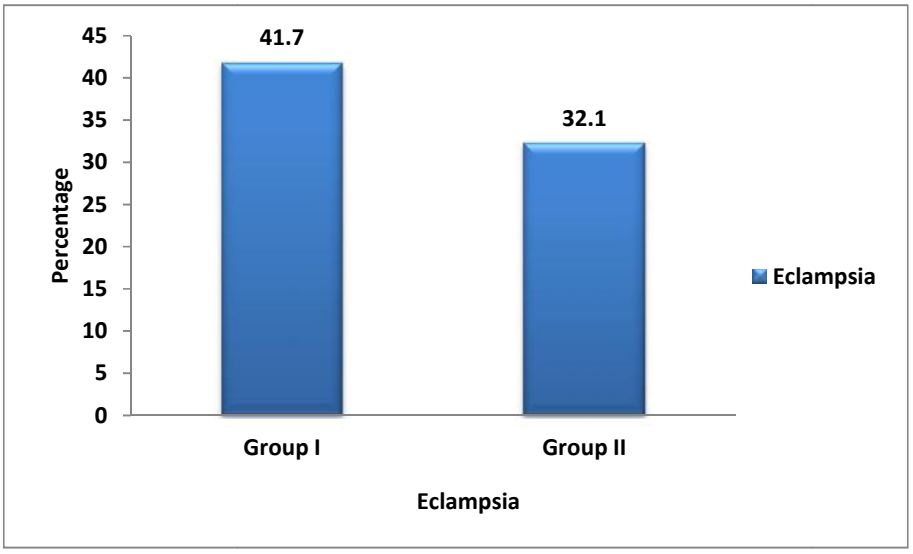


Table 10: No of eclampsia cases

Eclampsia	Group I		Group II		Total		p value
	N (Total 84)	Percent	N (Total 84)	Percent	N (Total 168)	Percent	
	35	41.7	27	32.1	62	36.9	0.201

Figure 10: Eclampsia



Total No of eclamspia cases in group I were 35 (41.7%) and in group II were 27 cases (32.1%).

P value being >0.05, which is not significant.

Table 11: Percent Distribution of SBP among Group I and II

SBP (mmHg)	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
<140	16	19.0	15	17.9	31	18.5	0.541
140-160	51	60.7	57	67.9	108	64.3	
>160	17	20.2	12	14.3	29	17.3	
Total	84	100.0	84	100.0	168	100.0	

Table 12 : Mean SBP among Group I and II

		Min	Max	Mean±SD	p value
SBP(mmHg)	**Group I**	110	190	151.0±18.9	0.168
	Group II	100	210	147.0±18.2	

In our study, in Group I mean systolic pressure is 151 mmHg and in group II mean systolic pressure was 147.0 mmHg. In group I ,16 cases (19%) had < 140 mmHg, 51 cases (60.7%) had between 140-160 mmHg,17 cases (20.2%) had BP > 160 mmHg.

In group II , 15 cases (17.9%) had BP < 140 mmHg, 57 cases (67.9%) had BP between 140-160 mmHg , 12 cases (14.3%) had BP >160mmHg.

P value being > 0.05 with is not significant.

Figure 11 : Systolic Blood Pressure(SBP)

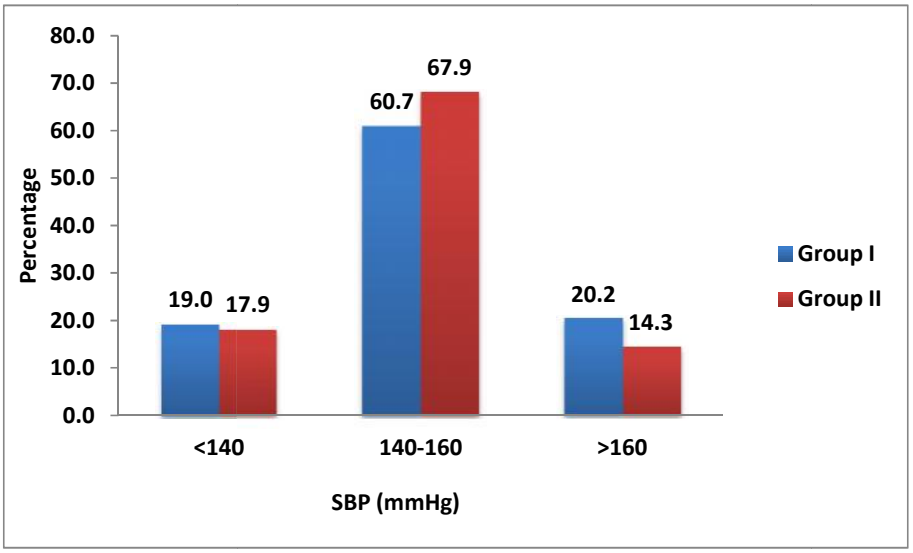


Figure 12: Mean SBP

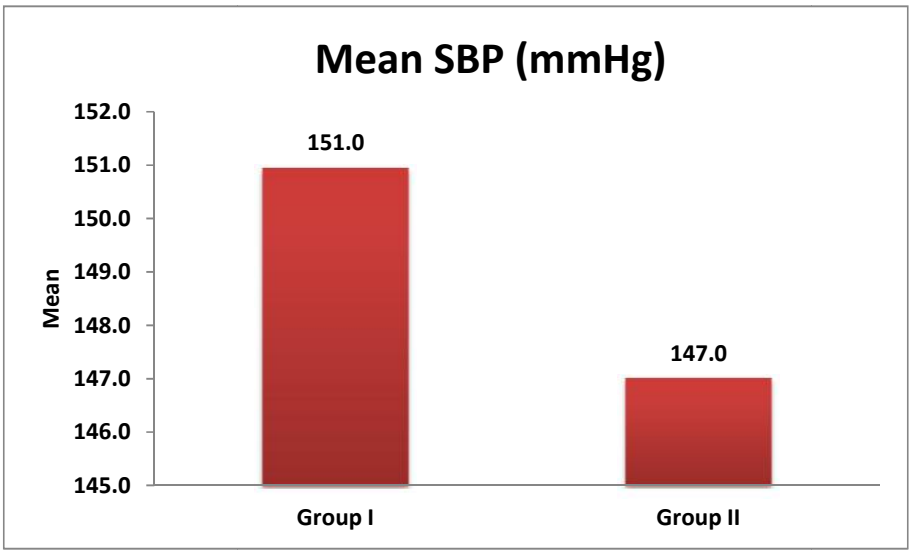


Table 13: Percent Distribution of DBP among Group I and II

DBP(mmHg)	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
<90	10	11.9	13	15.5	23	13.7	0.749
90-100	50	59.5	46	54.8	96	57.1	
>100	24	28.6	25	29.8	49	29.2	
Total	84	100.0	84	100.0	168	100.0	

Table 14 : Mean DBP among Group I and II

		Min	Max	Mean±SD	p value
DBP(mmHg)	**Group I**	60	120	98.5±13.0	0.474
	Group II	60	120	97.0±12.8	

In our study, In group I Mean diastolic blood pressure is 98.5 mmHg , In group II mean diastolic blood pressure is 97.0 mmHg.

In group I, 10 cases (11.9%) had BP < 90 mmHg, 50 cases (59.5 %) had between 90-100 mmHg, 24 cases (28.6%) had BP >100 mmHg. In group II, 13 cases (15.5%) had BP < 90 mmHg, 46 cases (54.8%) had BP 90- 100 mmHg, 25 cases (29.8%) had BP > 100 mmHg.

P value is > 0.05.

Figure 13: Diastolic Blood Pressure

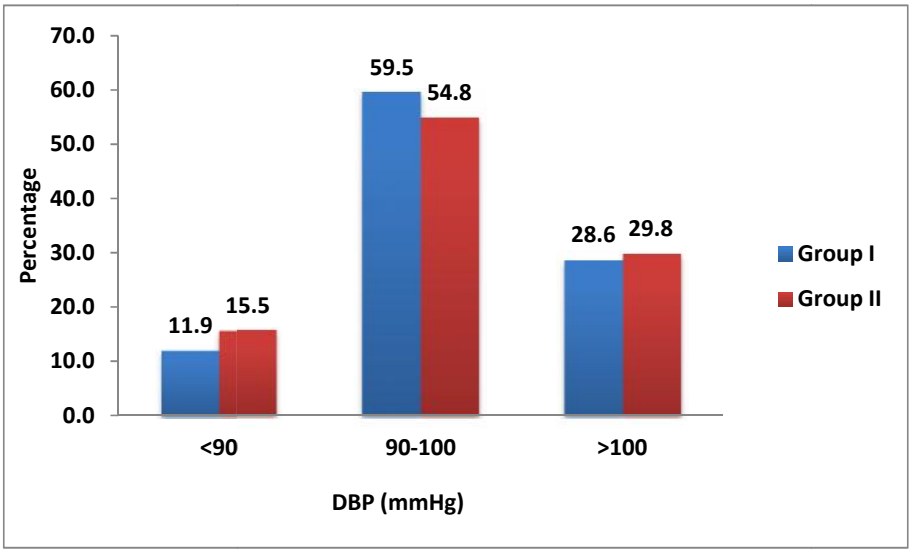


Figure 14: Mean Diastolic Blood Pressure

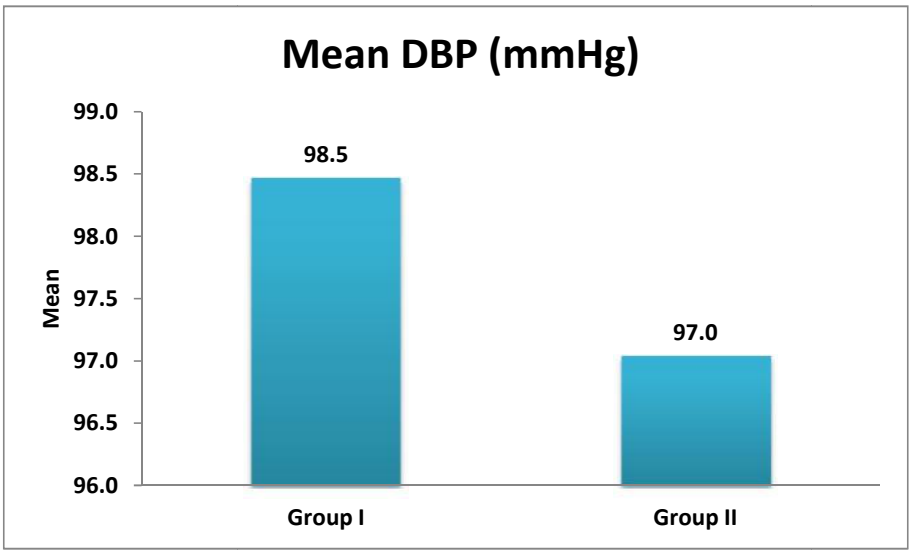


Table 15: Percent Distribution of Edema among Group I and II

Edema	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
No	18	21.4	9	10.7	27	16.1	0.059
Yes	66	78.6	75	89.3	141	83.9	
Total	84	100.0	84	100.0	168	100.0	

In our study, 66 cases (78.6%) had edema In group I , 18 cases (21.4%) had no edema. In group II , 75 cases (89.3%) had edema , 9 cases (10.7%) had no edema.

P value is >0.05 which is not significant.

Figure 15 : Edema

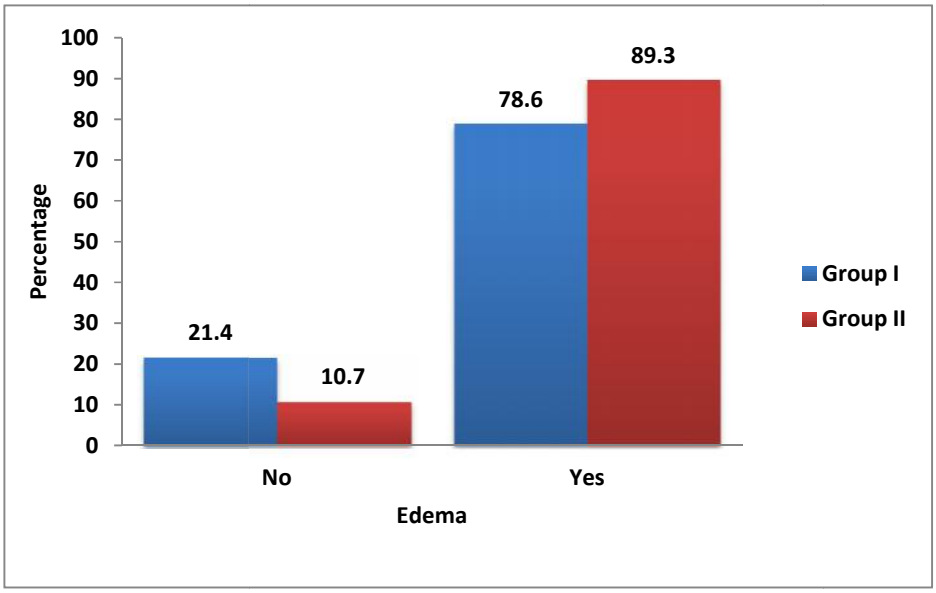


Table 16: Percent Distribution of Albuminuria among Group I and II

Albuminuria	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
Absent	6	7.1	7	8.3	13	7.1	0.722
1+	11	13.1	15	17.9	26	15.5	
2+	31	36.9	31	36.9	62	36.9	
3+	27	32.1	20	23.8	47	28.0	
4+	9	10.7	11	13.1	20	11.9	
Total	84	100.0	84	100.0	168	100.0	

In our study, In group I 6 cases (7.1%) had absent, 11 cases (13.1%)1+, 31 cases (36.9%) had 2+, 27 cases (32.1%) 3+, 9 cases (10.7 %) 4+ albuminuria.

In group II, 7 cases (8.3%) had absent , 15 cases (17.9%) had 1 +, 31 cases (36.9%) had 2+, 20 cases (23.8%) had 3+, 11 cases (13.1%) had 4+ albuminuria.

P value is 0.722 which is not significant.

Figure 16: Albuminuria

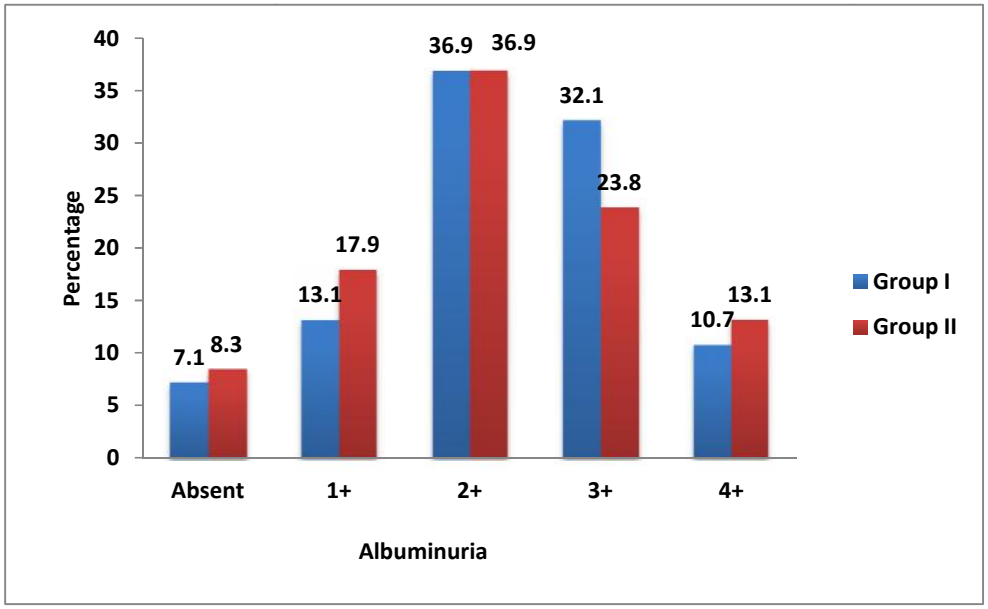


Table 17 : Percent Distribution of Fundoscopy among Group I and II

FUNDOSCOPY	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
GR-1	10	11.9	2	2.4	12	7.1	0.048
GR-2	3	3.6	2	2.4	5	3.0	
N	71	84.5	80	95.2	151	89.9	
Total	84	100.0	84	100.0	168	100.0	

In our study, 71 cases (84.5%) in group I , 80 cases (95.2%) in Group II had normal fundus finding.

In group I, 10 cases (11.9 %) had GR1, 3 Cases (3.6%) had GR2.

In group II, 3cases (3.6%) had GR1, 2 case (2.4%) had GR 2. P value being <0.05 significant

Figure 17: Fundoscopy

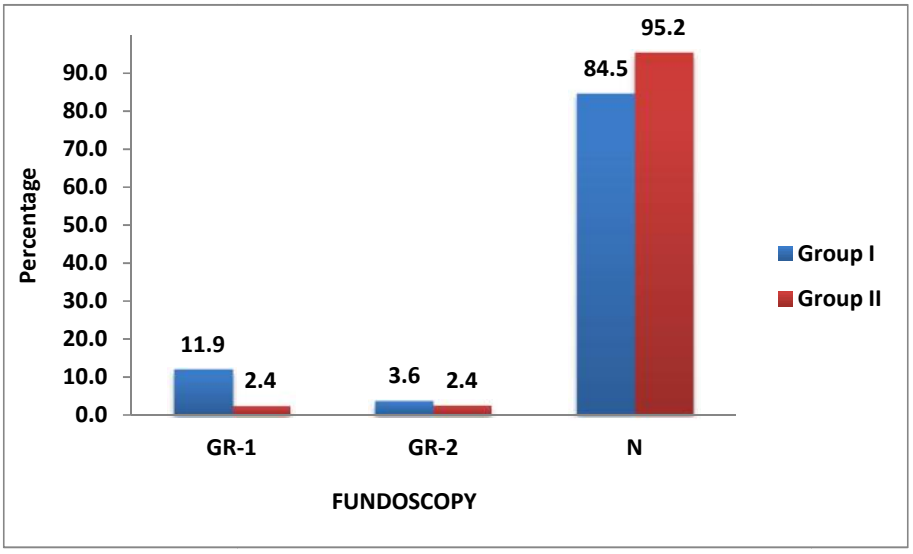


Table 18 : Percent Distribution of RFT among Group I and II

RFT	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
Normal	51	60.7	62	73.8	113	67.3	0.071
Raised	33	39.3	22	26.2	55	32.7	
Total	84	100.0	84	100.0	168	100.0	

In present study, 33 cases (39.3%) in group I, 22 cases (26.2%) in Group II had derranged Renal function test.

p value >0.05.

Figure 17: RFT

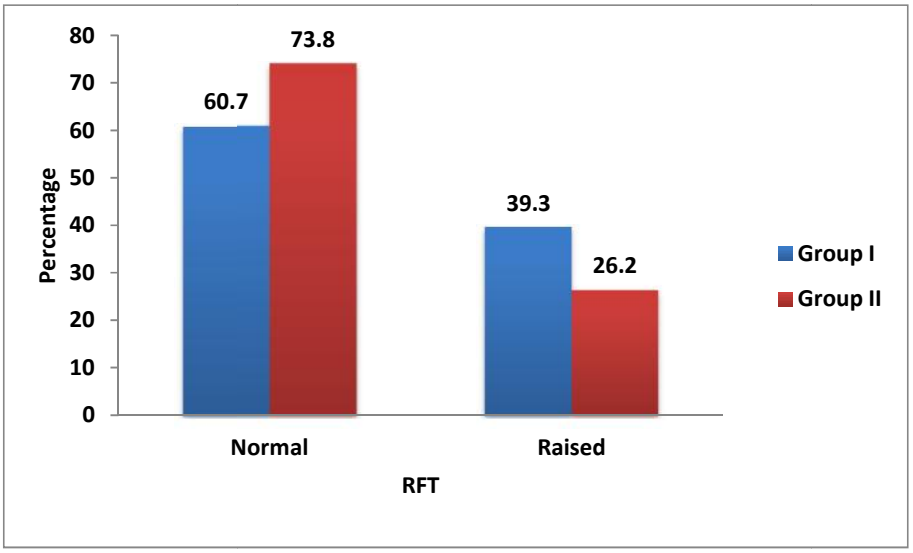


Table 19 : Percent Distribution of LFT among Group I and II

LFT	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
Normal	69	82.1	72	85.7	141	83.9	0.544
Raised	15	17.9	12	14.3	27	16.1	
Total	84	100.0	84	100.0	168	100.0	

In present study, 15 cases (17.9%) in group I, 12 cases (14.3%) group II had derranged liver function test.

Figure 18: LFT

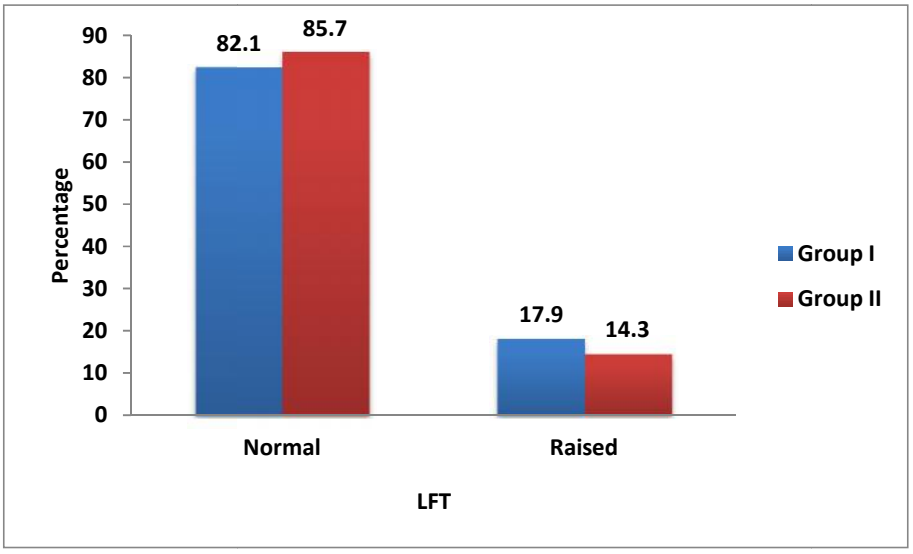


Table 20: Percent Distribution of Recurrence among Group I and II

RECURANCE	Group I		Group II		Total		p value
	N (Total 84)	Percent	N (Total 84)	Percent	N (Total 168)	Percent	
1+	1	1.2	10	11.9	11	6.5	0.004

In group I, 1 case (1.2%) out of 84 and in group II 10 cases (11.9%) out of 84 had recurrence of convulsion. Within group II, the proportion of recurrence is significantly higher (p value 0.004) with compare to proportion of recurrence in group I.

Figure 20: Recurrance among group I and II

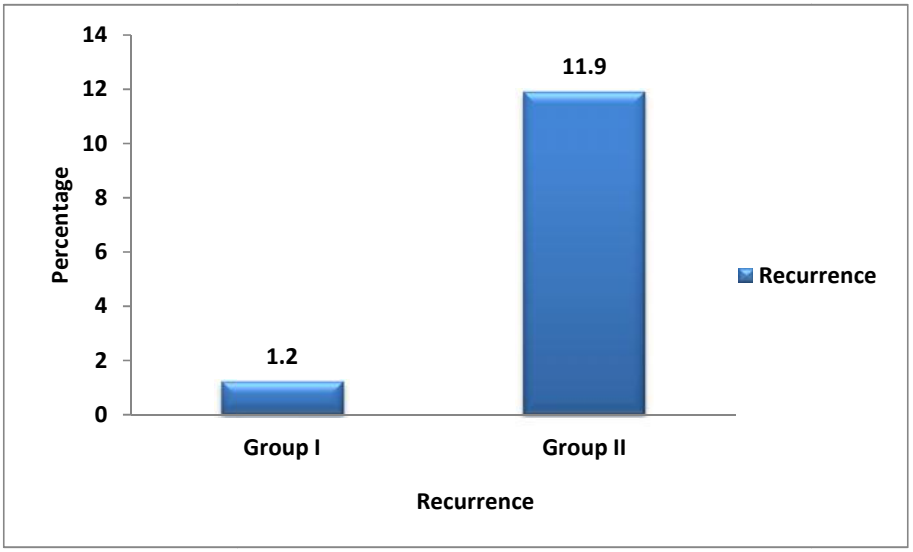


Table 21:Recurrence of convulsions in eclampsia patients

RECURANCE	Group I		Group II		Total		p value
	N (Total 35 eclampsia cases)	%	N (Total 27 eclampsia cases)	%	N (Total 62 eclampsia cases)	%	
1+	1	2.85	10	37.0	11	6.5	0.004

In group I, 1 case out of 35 eclampsia cases had recurrence of convulsion and 10 cases out of 27 eclampsia in group II had recurrence of convulsion. There were no convulsions in imminent eclampsia patients in both the groups.

P value being highly significant.

Figure 21 : Recurrence in eclampsia patients

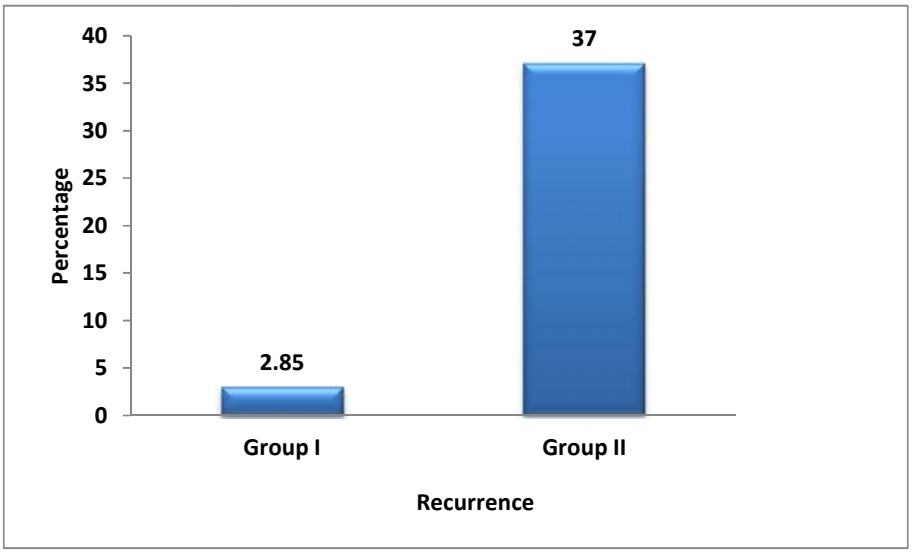


Table 22 : Percent Distribution of Mode of delivery among Group I and II

Mode of Delivery	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
CS	35	41.7	27	32.1	62	36.9	0.201
VD	49	58.3	57	67.9	106	63.1	
Total	84	100.0	84	100.0	168	100.0	

In our study, group I, 49 cases (58.3%) delivered vaginally, 35 cases (41.7%) by cesarean section .

In group II 57 cases (67.9%) delivered vaginally, 27 cases (32.1%) by cesarean section.

P value is >0.05 which is not significant.

Figure 22: Mode of delivery

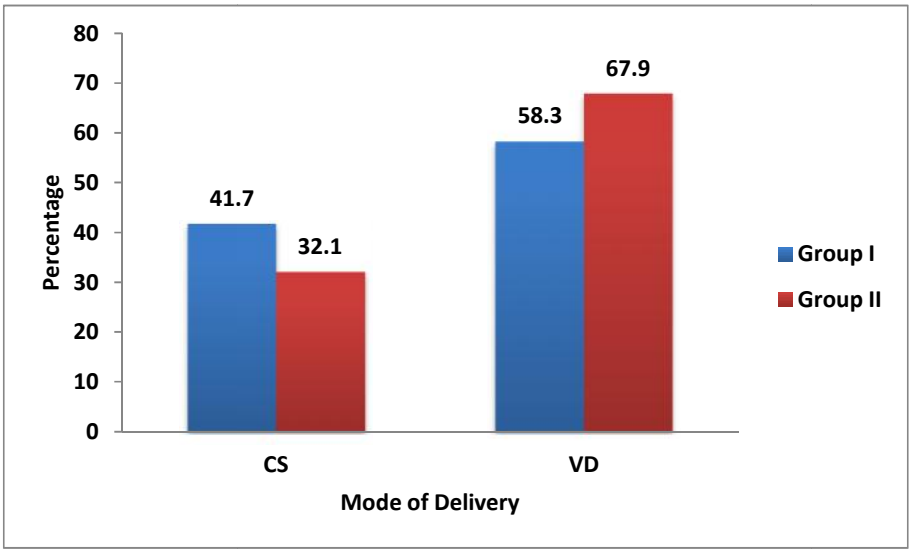


Table 23: Percent Distribution of Associated Complications among Group I and II

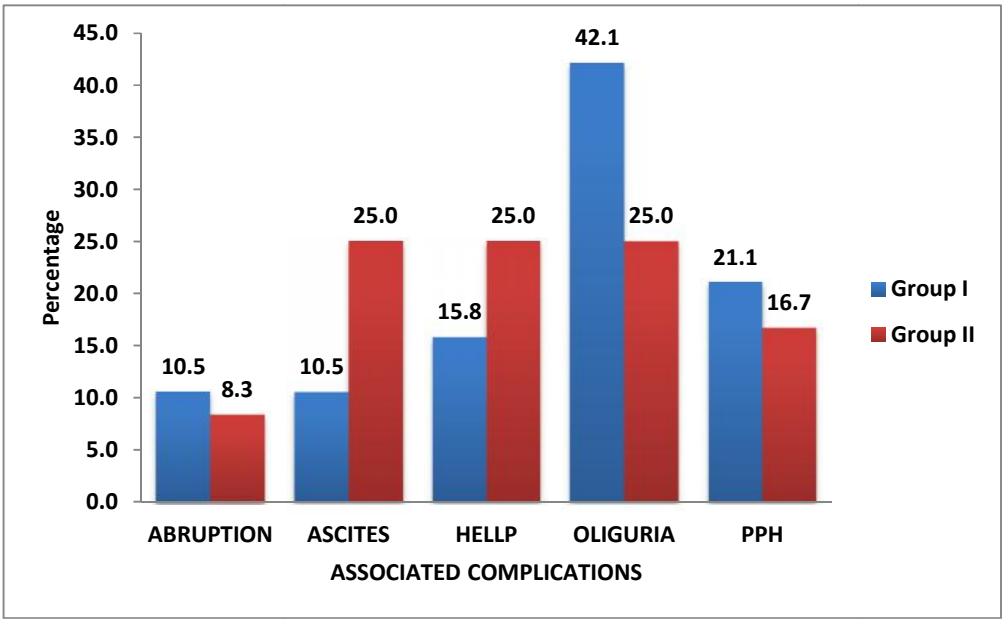
ASSOCIATED COMPLICATIONS	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
ABRUPTION	2	10.5	1	8.3	3	9.7	0.736
ASCITES	2	10.5	3	25.0	5	16.1	
HELLP	3	15.8	3	25.0	6	19.4	
OLIGURIA	8	42.1	3	25.0	11	35.5	
PPH	4	21.1	2	16.7	6	19.4	
Total	19	100.0	12	100.0	31	100.0	

In our Study, In group I two mothers (10.5%) had Abruption, two mothers (10.5%) had ascites, three mothers (15.8%) had HELLP syndrome, eight cases (42.1%) had oliguria , four mothers (21.1%) had PPH.

In group II, one mother (8.3%) had Abruption , three mothers (25%) had Ascites, three mothers (25%) had HELLP syndrome, three cases (25%) had oliguria, two mothers (16.7%) had PPH.

The p is value not significant.

Figure 23 : Associated complications



Maternal outcome.

There were no maternal deaths in both the groups.

Table 24: Percent Distribution of Fetal - live /dead among Group I and II

Fetal - live /dead	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
IUD	2	2.4	4	4.8	6	3.6	0.587
LIVE	76	90.5	76	90.5	152	90.5	
SB	6	7.1	4	4.8	10	6.0	
Total	84	100.0	84	100.0	168	100.0	

In our Study, In group I, live births 76 (90.5%), 6 (7.1%) were Still births, 2 (2.4%) were IUDs. 2 babies from group I had early neonatal death.

In group II, Live births 76 (90.5%), 4 cases (4.8%) was Still birth, 4 (4.8%) were IUDs.

The p value is not significant.

Figure 24: Fetal outcome.

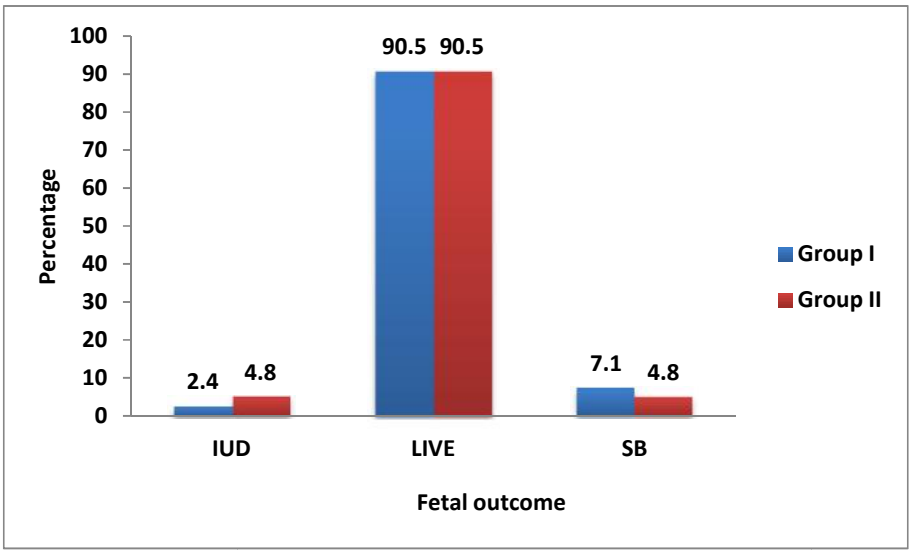


Table 25 : Percent Distribution of Fetal birth weight among Group I and II

Fetal birth weight (Kg)	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
≤ 1.5	11	13.1	8	9.5	19	11.3	0.771
1.5-2	25	29.8	22	26.2	47	28.0	
2.1-2.5	22	26.2	23	27.4	45	26.8	
>2.5	26	31.0	31	36.9	57	33.9	
Total	84	100.0	84	100.0	168	100.0	

In our Study, In group I, 11 (13.1%) weighed ≤ 1.5 kgs, 25 (29.8%) weighed 1.5- 2.0 kgs, 22 (26.2%) weighed 2.1-2.5 kgs and 26 (31%) weighed > 2.5 kgs.

In group II , 08 (9.5%) weighed ≤ 1.5 kgs, 22 (26.2%) weighed 1.5 -2.0 kgs, 23 (27.4%) weighed 2.1-2.5 kgs and 31 (36.9%) weighed > 2.5 kgs.

The p value is > 0.05.

Figure 25 : Fetal birth weight

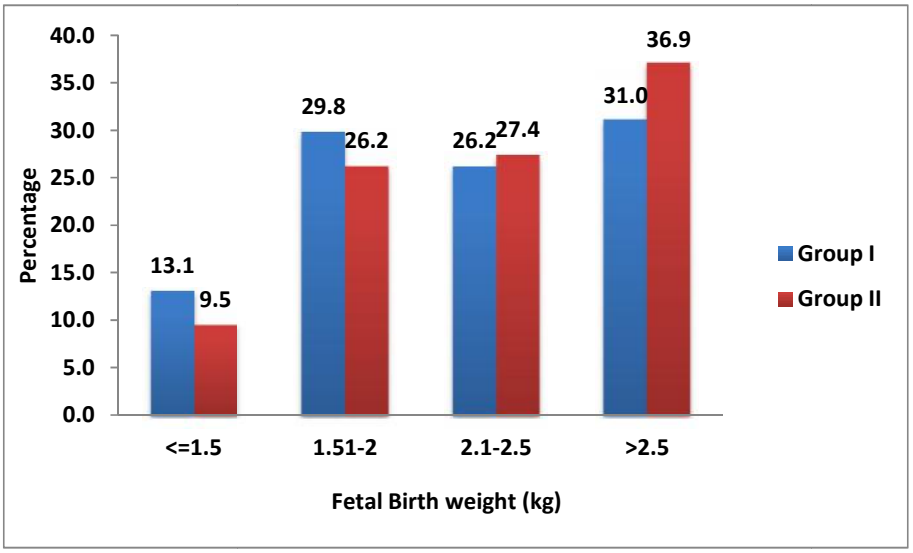


Table 26 : Percent Distribution of Apgar score at 5min among Group I and II

Apgar score	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
≤ 7	13	17.1	4	5.3	17	11.2	0.021
>7	63	82.9	72	94.7	135	88.8	
Total	76	100.0	76	100.0	152	100.0	

In our Study in group I , number of babies with apgar ≤ 7 were 13(17.1 %) and 4 babies (5.3%) in group II.

Number of babies with apgar >7 were 63 (82.9%) and 72 (94.7%) in group I and II.

P valve being 0.021 which is significant.

Figure 26 : Apgar score at 5 min

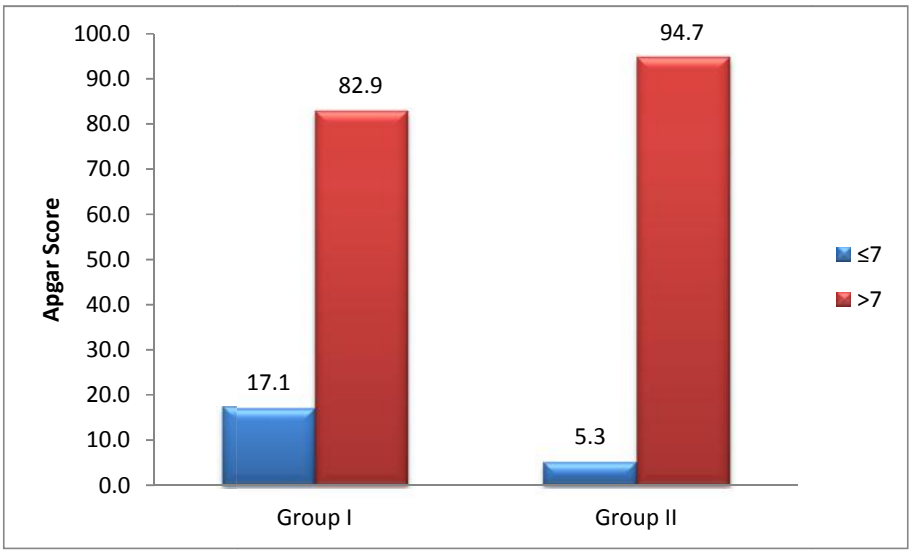


Table 27 : Percent Distribution of Term/Preterm among Group I and II

TERM/PRETERM	Group I		Group II		Total		p value
	N	Percent	N	Percent	N	Percent	
PRETERM	35	41.7	29	34.5	64	38.1	0.340
TERM	49	58.3	55	65.5	104	61.9	
Total	84	100.0	84	100.0	168	100.0	

In our study, 49 babies (58.3%) in group I and 55 (65.5%) babies in group II were Term.

In group I , 35 babies (41.7%) and 29 babies (34.5%) in group II were preterm.

p-value being >0.05 which is not significant.

Figure 27: Term / Preterm

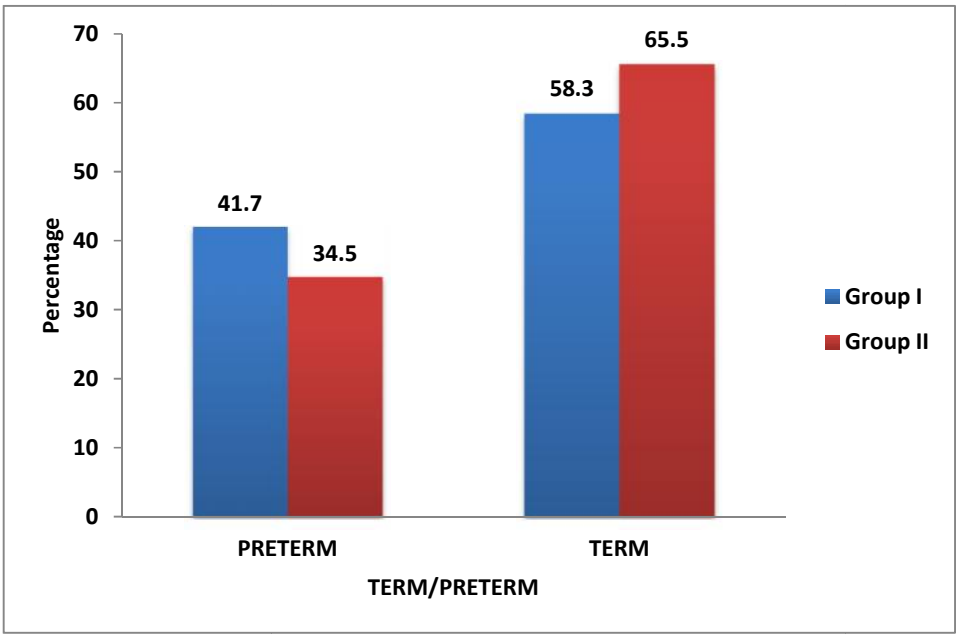


Table 28: Percent Distribution of NICU among Group I and II

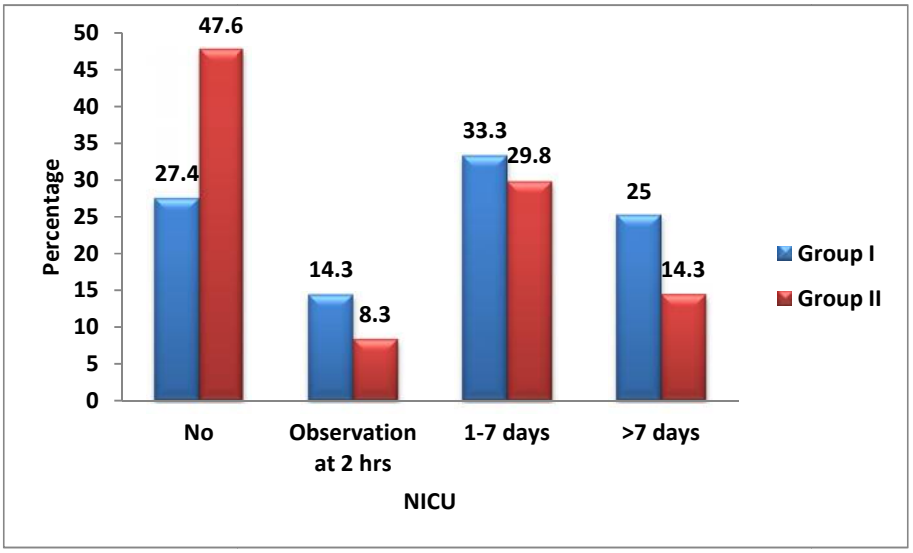
	Group I		Group II		Total		p value
NICU	**N**	**%**	**N**	**%**	**N**	**%**	
No	23	27.4	40	47.6	63	37.5	0.036
Observation at 2 hrs	12	14.3	7	8.3	19	11.3	
1-7 days	28	33.3	25	29.8	53	31.5	
>7 days	21	25	12	14.3	33	19.6	
Total	84	100	84	100	168	100	

In our study , In group I, 28 cases (33.3%) and in group II 25 cases (29.8%) were admitted to NICU upto 7 days . 2 babies in group I had early neonatal deaths .

21 cases (25%) in group I and 12 cases in group II (14.3%) were admitted to NICU for more than 7 days.

P value being <0.05 which is significant.

Figure 28: NICU admission



DISCUSSION

The present study is to study the efficacy and safety of a 10 gm intramuscular single loading dose of MgSO4 in treatment and prevention of recurrence of convulsions in eclampsia and to study its efficacy in prevention of eclamptic convulsions prophylactically in imminent eclampsia.

The Collaborative Trial [13] provided vital evidence that magnesium sulphate reduces the risk of recurrent seizures compared to other standard agents like diazepam and phenytoin.

The results from the study were analysed and compared with cases in other group in which Pritchard regimen was used during the study period.

AGE DISTRIBUTION

A study by Maheshwari J R et al [83] in 1989 reveals that 40.5% were under 20 years, 56.8% were between 21-29 and 2.7% above 30 years.

Lolkand et al in his study (1997) found that 40.7% were less than 20 years. In a study by Katz VL and colleagues [84] (2000) in the sacred heart medical centre USA the mean age of eclampsia was 22 years.

In our study the mean age in group I was 22.9 years and for group II is 22.7 years.

Parity

In the study of Eclmapsia collaborative trial group [13] (1995) 64% were primis. In the study by N.W.M. Hospital, Bombay 1989 [83], 64.9% were primis. According to

Mudaliar [85] over 75% were primis. In a study by Lalkoand et al (1997) 57.3% were primis.

In our study 118 were primis . In group I 56 (66.7%) and group II 62 (73.8%) were primis.

Gestational Age

In ECTG [13] study 39.5% cases were less than 34 weeks and 25.5% cases were presented between 34-36 weeks and 33% cases were presented at term.

In a study by renukamma et al [86] mean gestational age low dose group was 35 weeks and of Pritchard group was 35 weeks.

In our study in group I, the mean gestational age of group I is 36.5 weeks and group II is 37 weeks.

Blood Pressure

In ECTG [13] study 53% had a diastolic blood pressure above or equal to 110 mmHg.

In a study by renukamma et al [86] mean systolic B.P. in Low dose group was 147.575 mm Hg and Pritchard dose group was 147.8 mmHg. Mean diastolic B.P in Low dose group was 99.62 mmHg and Pritchard group was 99.6 mmHg.

In our study, in group I, mean systolic pressure is 151 mmHg and in group II mean systolic pressure was 147.0 mmHg.

In our study, mean diastolic blood pressure in group I is 98.5 mmHg, in group II mean diastolic blood pressure is 97.0 mmHg.

Albiminuria

It is a feature suggesting glomerular dysfunction and its presence with hypertension doubles the risk of perinatal death (Athula kaluarachi [87] 1998).

In our study , albiminuria in both the groups was not significantly different .

Mode of delivery

Pritchard [88] reported section rate of 33 % in his study while it was 14 % in sardesai's [14].

41.7% in group I and 32.1% in group II had cesarean section.

Maternal complications

The earliest sign of toxicity would be loss of tendon reflexes which usually occur when serum levels of 8-10mg/dl are reached.

In our Study, in group I two mothers had abruption, two mothers had ascites, three mothers had HELLP syndrome, eight cases had oliguria , four mothers had PPH.

In group II one mother had abruption , three mothers had ascites , three mothers had HELLP syndrome, three cases had oliguria, two mothers had PPH.

The most common complication noted in group I was oliguria, this complication was comparatively less in group II probably due to low dose MgSO4.

Recurrence

Pritchard [88] and sibai [12] reported recurrence rate of 12.1 and 14.2 % respectively. The CET[13] reported recurrence rates in a range of 5.7 to 13.2 %. The recurrence rate observed in sardesai's low dose [14] study was 8 % .

In 1978, zuspan [89] states that he saw no convulsions in pre-eclampsia patients on magnesium sulphate.

In our study, there were no convulsions in imminent eclampsia patients in both the groups.

In eclampsia patients, in group I, one patient (2.85%) out of 35 cases had recurrence and in group II, 10 patients (37%) out of 27 cases had recurrence which was statistically significant.

Out of 10 cases in group II, who had recurrence of convulsion, 8 patients were antepartum and 2 patients had intrapartum. There were no recurrence of convulsions in postpartum eclampsia patients.

The reason for high recurrence could be low dose of MgSO4 with less therapeutic levels in our study.

All the patients who had recurrence in group II were switched on to group I regime and one patient in group I who had recurrence was given 2 gm iv dose.

Maternal Mortality

The maternal mortality between 1991-1997 approximately 6% in US were related to Eclampsia (Berg & co-workers 2003).

The maternal mortality with ECTG study [13] 1995 5.2%, Eclampsia Trial Collaborative Group 1995 with magnesium sulphate was 3.8%.

In our study , there were no maternal deaths in both the groups.

Fetal outcome

In Magpie trial group [15] study Still birth is 8.2%, Early Neo Natal death is 3.2%

In our Study, in group I, 6 cases (7.1%) were still born and 2 cases (2.4%) were intrauterine deaths. 2 babies in group I had early neonatal deaths.

In group II, 4 cases (4.8 %) were still born and 4 cases (4.8%) were intrauterine deaths.

Babies in group I had more number of still births compared to group II, which can be attributed to respiratory distress and decreased fetal heart rate variability.

Apgar score at 5 mins

In a study conducted by okusanya[16] , the mean apgar score at 5 minutes of life was 8± 2.8 and 8.5±2.9 for the 10 g and 14 g group and did not differ significantly.

In our study, apgar score at 5 min was significantly lower in group I compared to group II. One of the side effect of MgSO4 on fetus.

Duration of NICU admission

In our study, group I had more number of babies with apgar score ≤ 7 and required prolonged NICU stay compared to group II.

In group I, 28 cases (33.3%) and in group II 25 cases (29.8%) were admitted to NICU upto 7 days . 2 babies in group I had early neonatal deaths.

21 cases (25%) in group I and 12 cases in group II (14.3%) were admitted to NICU for more than 7 days.

The reason for more duration of NICU stay in group I is low apgar at 5 min of birth which could be due to the effect of MgSO4 on fetus causing respiratory distress and decreased fetal heart rate variability and the other common reason for NICU admission in both the groups was preterm birth.

CONCLUSION

The anticonvulsant drug of choice in woman with eclampsia is Magnesium sulphate . Present study, shows that 10 gm intramuscular single loading dose is as effective as standard regimen in preventing occurrence of convulsion prophylactically in imminent eclampsia patients but the dose is not sufficient enough to prevent recurrence in eclampsia patient.

The dose used in our study had efficient secondary outcome measures with comparable maternal outcome and good fetal outcome.

According to our study not all patients of imminent eclampsia and eclampsia require standard regime. Proper selection of the patient for 10 gm single intramuscular dose would avoid the side effects of higher dose on both fetus and mother.

SUMMARY

This is a randomized study conducted in shri B M Patil medical college, Vijayapur. 168 patients randomized into group I and II (84 each) with imminent eclampsia, antepartum, intra and postpartum eclampsia were included in the study. Magnesium sulphate was used in control of convulsions .

A detailed history regarding age, parity, gestational age, past h/o PIH, number of convulsions, h/o imminent symptoms were taken. A thorough general examination and obstetric examination was made. Investigations related to eclampsia like renal functions test, Liver functions, haematological investigations were carried out in all patients.

Two treatment regimens, Pritchard regimen (group I) and 10 gm i.m single loading dose (group II) were compared for their efficacies in preventing occurance of convulsions in imminent eclampsia, prevention of recurrence of convulsions in eclampsia patients.

Secondary outcome measures such as maternal and fetal outcome were compared.

- Mean age In group I was 22.7 and group II was 22.9 , p value being >0.05 is not significant.
- In group I 66.7% were primis, In group II 73.8% were Primis and. P value being > 0.05 is not significant.
- In group I, 20.5% had h/o PIH, In group II 22.5 % had past h/o of PIH . P value being >0.05 with is not significant.
- The mean gestational age of group I is 36.7 weeks and group II is 37 weeks. The p value is >0.05 which is insignificant.

- 96.4 % in group I, 95.2% of women in group II were booked, p value being >0.05 is not significant.
- 92.9% in group I and 91.7% in group II had premonitary symptoms . The p value is >0.05 which is insignificant.
- Mean systolic B.P. in group I was 151.0 mmHg , in group II was 147.0 mm Hg.
- Mean diastolic B.P in group I was 98.5 mmHg , group II was 97.0 mm Hg. P value being > 0.05 is not significant. 78.6% had edema in group I, 89.3% had edema in group II. P value is >0.05 which is not significant.
- 10 g intramuscular single dose regimen (group II) was successful in preventing occurrence of convulsions in imminent eclampsia patients but recurrence of convulsions in eclampsia patients was significantly high (37%) compared to standard pritchards regimen (2.85%) suggesting the need for higher dose in this group of patients.
- Incidence of LSCS was 41.7% in group I , 32.1% in group II. P value > 0.05 is not significant.
- There were no maternal deaths in both the groups.
- Live births, in group I 90.5%, in group II 90.5% p value is >0.05 is not significant.
- In group I Still birth 7.1%, in group II 4.8% , P value is >0.05, which is not significant.
- Apgar score at 5 minutes was less in group I and these babies required NICU admission for prolonged duration comapared to group II indicating the side effect of magnesium sulphate causing respiratory distress and decreased fetal heart rate variability.

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ANNEXUE-I

ETHICAL CLEARANCE

BIJAPUR-586 103.
OUTWARD
No. SD/13
Date. 14-11-13

B.L.D.E. UNIVERSITY'S
SHRI.B.M.PATIL MEDICAL COLLEGE, BIJAPUR-586 103
INSTITUTIONAL ETHICAL COMMITTEE

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The Ethical Committee of this college met on 13-11-2013 *at* 3-30pm *to scrutinize the Synopsis of Postgraduate Students of this college from Ethical Clearance point of view. After scrutiny the following original/corrected & revised version synopsis of the Thesis has been accorded Ethical Clearance.*

Title "A randomised control trail to compare efficacy of 10gm intramuscular single loading dose MgSO4 with standard pritchard regime for imminent eclampsia & eclampsia"

Name of P.G. student Dr. Mounika Reddy Chitikela.
Department of Obstetrics & Gynecology.

Name of Guide/Co-investigator Dr. Shailaja R. Bidri, Professor
Department of Obstetrics & Gynecology.

DR.TEJASWINI. VALLABHA
CHAIRMAN
INSTITUTIONAL ETHICAL COMMITTEE
BLDEU'S, SHRI.B.M.PATIL
MEDICAL COLLEGE, BIJAPUR.

Following documents were placed before E.C. for Scrutinization
1) Copy of Synopsis/Research project.
2) Copy of informed consent form
3) Any other relevant documents.

ANNEXUE-II

CASE SHEET PROFORMA

Name: Date:

Age/Sex: O.P.No./I.P.NO

Occupation: case no:

Group I :

Group II :

DOA: DOD:

Address:

Chief complaints:

History of presenting complaints:

Antenatal history:

- Booked/unbooked
- Immunised/unimmunised:
- I trimester
- II trimester
- III trimester

Obstetric history

- Married life
- Obstetric score

Menstrual history

- PAST MENSTRUAL CYCLE
- LMP
- EDD POG:

Past history:

Family history:

Personal history:

GENERAL PHYSICAL EXAMNIATION:

Build & nourishment: P.R :

Height: B.P :

Weight: R.R :

Temp;

Breast:

Thyroid:

Spine :

Pallor/ icterus / cyanosis /clubbing / edema / lymphadenopathy.

SYSTEMIC EXAMINATION:

CVS:

RS:

PER ABDOMEN:

PER SPECULUM EXAMINATION:

(IF REQUIRED)

PER VAGINAL EXAMINATION:

INVESTIGATIONS / INTERVENTIONS:

1. **BLOOD INVETIGATIONS**:

- CBC:
- HIV:
- HBsAg:
- BLOOD GROUPING AND TYPING:
- BT:
- CT:
- RBS:

2. **DIC PROFILE :**
3. **URINE ROUTINE**:
4. **BLOOD UREA , SERUM CREATININE & URIC ACID:**

   LFT
5. **NON-STRESS TEST**
6. **FUNDOSCOPY**

OBSTETRIC ULTRASOUND(IF NECESSARY)

GROUP-I

S.NO	TIME	DOSE OF MAGNESIUM SULPHATE	ROUTE OF ADMINISTRATION	PR	BP	CVS/RS	KNEE JERK	RR	URINE OUTPUT	CONVULSIONS	COMPLICATIONS

GROUP II

SNO -	TIME	DOSE OF MAGNESIUM SULPHATE	ROUTE OF ADMINISTRATION	PR	BP	CVS/RS	KNEE JERK	RR	URINE OUTPUT	CONVULSIONS	COMPLICATOINS

PERINATAL OUTCOME

NO OF PATIENTS	LIVE BIRTH	STILL BIRTH	APGAR	DURATION OF NICU STAY

ANNEXURE – III

. INFORMED CONSENT FORM:

B.L.D.E.UNIVERSITY'S SHRI B.M. PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE, BIJAPUR – 586103, KARNATAKA

TITLE OF THE PROJECT: A RANDOMISED CONTROL TRIAL TO COMPARE EFFICACY OF 10 gm INTRAMUSCULAR SINGLE LOADING DOSE OF $MgSo_4$ WITH STANDARD PRITCHARD REGIME FOR IMMINENT ECLAMPSIA AND ECLAMPSIA.

PRINCIPAL INVESTIGATOR: DR. MOUNIKA REDDY CHITIKELA
POST GRADUATE ,DEPARTMENT OF OBSTETRICS & GYNECOLOGY.
B.L.D.E.UNIVERSITY'S SHRI B.M. PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE, BIJAPUR – 586103

PG GUIDE : DR. MRS.SHILAJA. R. BIDRI
PROFESSOR M.D., D.G.O
DEPARTMENT OF OBSTETRICS & GYNECOLOGY.
B.L.D.E.UNIVERSITY's SHRI B.M. PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTRE, BIJAPUR – 586103

PURPOSE OF RESEARCH:

I have been informed that this will be a comparative study of single dose 10 gm intramuscular mgso4 with standard Pritchard regime for imminent eclampsia and eclampsia in pregnant women visiting to BLDE University's Shri B.M. Patil Medical College Hospital & Research Centre, Bijapur.

I have been explained about the reason for doing this study and selecting me/my ward as a subject for this study. I have also been given free choice for either being included or not in the study.

PROCEDURE:

I/my ward have been explained that, I/my ward will be subjected to obstetric examination & investigations in pregnant women visiting our hospital.

I/my ward will be followed up withcertain routine blood and urine investigations, USG until I/my ward will be discharged.

RISKS AND DISCOMFORTS:

I/my ward understand that I/my ward would not have any discomfort with my study. I/my ward understand that necessary measures will be taken to reduce any kind of complications as and when they arise.

BENEFITS:

I/my ward understand that my participation in this study will help to analyse the potential use of single dose of 10 gm i.m. $MgSo_4$ in imminent eclampsia & eclampsia patients & to assess maternal & fetal outcome.

CONFIDENTIALITY:

I/my ward understand that medical information produced by this study will become a part of this Hospital records and will be subjected to the confidentiality and privacy regulation of BLDE University's Shri B.M. Patil Medical College Hospital & Research Centre, bijapur. Information of a sensitive, personal nature will not be a part of the medical records, but will be stored in the investigator's research file and identified only by a code number. The code key connecting name to numbers will be kept in a separate secure location.

If the data are used for publication in the medical literature or for teaching purpose, no names will be used and other identifiers such as photographs and audio or video tapes will be used only with my special written permission. I understand that I may see the photograph and videotapes and hear audiotapes before giving this permission.

REQUEST FOR MORE INFORMATION:

I understand that I may ask more questions about the study at any time .Dr.Mounika Reddy Chitikela is available to answer my questions or concerns. I/my ward understand that I will be informed of any significant new findings discovered during the course of this study, which might influence my continued participation.

If during this study, or later, I wish to discuss my participation in or concerns regarding this study with a person not directly involved, I am aware that the social worker of the hospital is available to talk with me.And that a copy of this consent form will be given to me for careful reading.

REFUSAL OR WITHDRAWL OF PARTICIPATION:

I/my ward understand that my participation is voluntary and I may refuse to participate or may withdraw consent and discontinue participation in the study at any time without prejudice to my present or future care at this hospital.

I/my ward also understand that Dr.Mounika Reddy Chitikela will terminate my participation in this study at any time after he has explained the reasons for doing so and has helped arrange for my continued care by my own physician or therapist, if this is appropriate

STUDY SUBJECT CONSENT STATEMENT:

I/my ward confirm that Dr.Mounika Reddy Chitikelahas explained to me the purpose of this research, the study procedure that I will undergo and the possible discomforts and benefits that I may experience, in my own language.

I/my ward have been explained all the above in detail in my own language and I understand the same. Therefore I agree to give my consent to participate as a subject in this research project.

_____ _____

(Participant) Date

_____ _____

(Witness to above signature) Date

ANNEXURE – IV

KEY TO MASTER CHART

Gravidity

1. Primigravida.
2. Multigravida

Past history of PIH

1. A – absent.
2. P – present.

Antenatal care

1. B – Booked.
2. UB – Unbooked.

Premonitary signs

1. P – present.
2. A – Absent.

Type of eclampsia.

1. IE – Imminent eclampsia
2. APE – Antepartum eclampsia
3. IPE – Intrapartum eclampsia
4. PPE - Postpartum eclampsia.

Edema

1. + - present.
2. – absent

Fundoscopy

1. N – Normal.
2. GR- Grade.

RFT/LFT

1. N- Normal
2. R-Raised

Mode of delivery

1. CS – Cesarean section.
2. VD – Vaginal delivery.

Fetal outcome

1. L – Live.
2. IUD – intrauterine death.
3. SB – still birth.

Blood pressure

1. SBP –Systolic blood pressure.
2. DBP-Diastolic blood pressure.

MASTER CHART

Sl No	Names	Age in yrs	group	Gravidity	Past h/o PH	Gestational age (wks)	Antenatal care	Premonitory -signs	No of conulsions	Type of eclampsia	bp in mmhg	Edema	Albuminuria	FUNDOSCOPY	RFT	LFT	RECURANCE	Mode of declivery	ASSOCIATED COMPLICATIONS	Maternal Outcome	Fetal - live /dead	Weight (kgs)	apgar at 5 min	TERM/PRETERM	NICU	failed
1	JAYASHREE	20	I	Primi	A	38	B	P	4	APE	140/90	+	2+	N	R	N	-	CS		L	L	2.5	6	T	10 days	
2	SRIDEVI	22	II	Primi	A	39	B	P	-	IE	150/100	+	3+	N	N	R	-	CS		L	IUD	2	-	T	-	
3	RAJASHRI	26	II	G4	P	35	B	P	4	APE	144/90	+	4+	N	N	N	1+	CS	ASCITES	L	L	1.5	7	PT	14 days	II - I
4	ASHA	20	I	Primi	P	38	B	P	-	IE	170/110	+	2+	GR-1	N	N	-	CS		L	L	2.27	8	T	2DAYS	
5	KALAVATHI	20	I	Primi	A	40	B	A	-	IE	140/100	+	A	N	R	N	-	CS		L	L	3.34	9	T	2DAYS	
6	SONY	22	II	Primi	A	39	B	A	6	APE	170/100	-	A	GR-2	N	N	1+	CS		L	SB	1.98	-	T	-	II-I
7	JAYASHREE	25	II	Primi	P	37	B	P	-	IE	140/90	+	1+	N	N	N	-	FTVD		L	L	2.7	9	T	-	
8	MAHANANDAWALI	24	I	Primi	A	27	B	A	5	APE	140/90	+	3+	GR-2	R	R	-	PTVD	ASCITES	L	SB	1.3	-	PT	-	
9	SALMA	23	II	G2	A	27	UB	P	-	IE	140/90	+	2+	N	N	N	-	PTVD		L	IUD	1.7	-	PT		
10	SAKKUBAI	20	II	Primi	A	35	B	P	8	APE	100/60	+	3+	GR-1	R	N	-	CS		L	L	2.36	7	PT	14DAYS	
11	TAMANNA	21	I	Primi	P	34	B	A	3	APE	130/100	+	1+	N	N	N	-	CS		L	L	1.7	8	PT	8DAYS	
12	JAYASHREE	19	I	G2	A	35	B	P	7	IPE	130/60	-	A	N	R	R	-	PTVD	ABRUPTION	L	IUD	2	-	PT	-	
13	DEEPA	19	II	Primi	A	39	B	P	-	IE	150/100	+	3+	N	N	N	-	FTVD		L	L	2.9	9	T	-	
14	KAVITA	22	I	Primi	A	33	B	P	-	IE	190/110	+	3+	N	R	N	-	PTVD		L	L	1.4	9	PT	18 DAYS	
15	ROOPA	28	II	G3	A	39	B	P	-	IE	140/100	+	1+	N	N	N	-	FTVD		L	IUD	2	-	T	-	
16	SHOBHA	28	I	Primi	P	40	B	P	-	IE	150/100	-	2+	N	R	N	-	CS	OLIGURIA	L	L	2.6	8	T	2DAYS	
17	SAKKUBAI	20	I	Primi	A	43	B	P	8	IPE	170/120	+	1+	GR-2	R	R	-	CS		L	L	2.56	6	T	8DAYS	
18	DEEPA	18	I	Primi	A	33	UB	P	6	APE	170/110	+	2+	N	R	N	1+	CS		L	L	1.9	6	PT	10DAYS	I
19	MAHABOOBI	22	II	G3	P	34	B	A	-	IE	160/110	+	1+	N	N	N	-	PTVD		L	L	1.9	9	PT	1DAY	
20	SAVITA	25	II	Primi	A	36	B	A	4	APE	120/80	+	3+	N	N	N	-	CS		L	L	2.8	9	PT	2HRS	
21	RENUKA	21	I	Primi	A	38	B	P	6	APE	110/70	-	A	GR-1	N	N	-	FTVD	OLIGURIA	L	IUD	2	-	T	-	

22	DIVYASHREE	22	I	Primi	A	40	B	P	-	IE	130/100	+	2+	N	N	N	-	CS		L	L	3	9	T	2HRS	
23	PARUBAI	28	II	G4	A	32	B	A	3	APE	150/100	+	1+	N	R	R	-	PTVD	HELLP	L	SB	1.6	-	PT	-	
24	AKKAMAHADEVI	20	II	Primi	A	39	B	P	6	APE	140/90	+	1+	N	N	N	1+	FTVD	OLIGURIA	L	L	2	8	T	2DAYS	II-I
25	HEENASHA	19	I	Primi	A	35	B	P	-	IE	150/100	-	3+	N	N	N	-	CS		L	L	1.2	9	PT	20DAYS	
26	SHAHARABANU	25	II	Primi	A	31	b	P	1	APE	150/100	-	A	N	R	N	-	PTVD		L	L	1.1	8	PT	20DAYS	
27	RENUKA	18	I	Primi	A	25	B	P	-	IE	150/90	+	3+	GR-1	N	N	-	PTVD		L	L	1.68	9	PT	8DAYS	
28	VAISHALI	19	II	Primi	A	38	B	P	2	APE	150/110	+	A	N	R	N	-	CS		L	L	2.8	8	T	6DAYS	
29	MAHADEVI	21	II	Primi	P	39	B	P	-	IE	170/110	+	2+	GR-1	N	N	-	PTVD	ABRUPTION	L	SB	1.1	-	T	-	
30	SAVITA	21	I	G2A1	A	39	B	P	-	IE	170/120	-	2+	N	N	N	-	FTVD		L	L	2	8	T	2DAYS	
31	NEELIMA	20	I	Primi	A	43	B	P	-	IE	140/110	-	4+	N	N	N	-	CS		L	L	2.9	9	T	-	
32	KAVERI	25	II	Primi	P	35	B	P	-	APE	160/110	+	3+	N	N	N	-	PTVD	ASCITES	L	L	1.8	7	PT	10DAYS	
33	NOORIAN	20	II	G4	P	38	B	P	-	IE	150/90	-	2+	N	N	N	-	FTVD		L	L	2.2	9	T	-	
34	SARASWATHI	29	I	Primi	P	35	B	P	-	IE	170/110	+	1+	N	N	N	-	CS		L	L	2	9	PT	1day	
35	SUREKHA	27	I	G4A3	P	38	B	P	-	IE	170/100	+	3+	N	R	N	-	PTVD	PPH	L	L	2	9	T	1day	
36	SHANTHABAI	30	II	G4	A	41	B	P	-	IE	210/120	+	4+	N	R	R	-	FTVD		L	L	2.8	9	T	1DAY	
37	MALANBEE	21	II	Primi	A	34	B	P	3	APE	150/100	+	2+	N	R	N	1+	PTVD		L	L	2.1	7	PT	8DAYS	II-I
38	ASHWINI	20	II	Primi	A	40	B	P	5	IPE	170/100	-	1+	N	R	N	1+	CS		L	L	3	9	T	1day	II-I
39	NIRMALA	22	I	Primi	A	36	B	P	2	APE	130/90	+	2+	GR-1	R	N	-	PTVD	OLIGURIA	L	L	1.6	6	PT	14DAYS	
40	AASHA	21	I	Primi	A	34	B	P	3	IPE	150/100	+	2+	N	R	N	-	PTVD		L	L	1.6	6	PT	12DAYS	
41	KAVITHA	19	I	Primi	A	36	B	P	-	IE	140/100	+	2+	N	N	N	-	CS		L	L	2.3	9	PT	1DAY	
42	ROOPA	18	II	Primi	A	39	B	P	-	IE	140/90	+	2+	N	N	N	-	CS		L	L	3.4	9	T	-	
43	PARVATHI	24	I	Primi	A	35	B	P	5	APE	150/110	+	4+	N	R	R	-	PTVD	HELLP	L	L	2.5	6	PT	8DAYS	
44	RAJASHREE	25	II	Primi	A	42	B	P	2	IPE	130/90	+	2+	N	N	R	1+	FTVD	ASCITES	L	L	2.6	8	T	14DAYS	II-I
45	SAKKUBAI	28	I	G5	A	33	B	P	3	APE	190/120	-	1+	N	N	N	-	PTVD		L	L	1.7	9	PT	7DAYS	
46	LALITHA	22	II	G5	A	32	B	P	2	APE	140/90	-	A	N	N	N	-	PTVD		L	L	2.1	8	PT	5DAYS	
47	SANGEETA	22	I	Primi	P	38	B	P	-	IE	160/100	+	3+	N	R	R	-	CS		L	L	2.2	9	T	2HRS	
48	MANJULA	19	II	Primi	A	39	B	P	4	APE	130/70	+	2+	N	N	N	-	CS		L	L	3.4	9	T	-	
49	SAKKUBAI	30	II	G5	P	33	B	P	-	IE	150/90	+	4+	N	N	N	-	PTVD	OLIGURIA	L	L	1.6	8	PT	8DAYS	
50	GEETA	25	I	Primi	A	39	B	P	1	APE	160/100	+	3+	N	R	N	-	CS		L	L	2.69	9	T	-	
51	NEELIMA	21	I	G2	A	37	B	P	-	IE	130/90	-	2+	N	N	N	-	FTVD		L	L	2.2	9	T	1day	
52	MADIVALAMMA	20	II	Primi	A	37	B	P	-	IE	150/110	+	2+	N	N	N	-	FTVD	PPH	L	L	3.2	9	T	-	
53	NEETRA	20	I	Primi	A	36	B	P	4	PPE	110/80	-	A	N	R	R	-	PTVD	-	L	L	2.4	9	PT	-	

54	GEETA	23	II	G2	P	42	B	P	-	IE	140/90	-	2+	N	N	N	-	FTVD		L	L	2.5	9	T	6HRS	
55	ROOPA	20	II	Primi	A	32	B	P	1	APE	150/100	+	3+	N	N	N	1+	PTVD	ABRUPTION	L	IUD	1.2	-	PT	-	II-I
56	JAYASHREE	20	I	Primi	P	37	B	P	-	IE	150/100	+	3+	N	R	N	-	CS		L	L	1.9	8	T	3DAYS	
57	RAMZAN	28	II	G3	A	38	B	P	-	IE	180/100	+	3+	N	R	N	-	CS		L	L	2.2	9	T	1DAY	
58	ANITA	24	I	Primi	A	40	B	P	-	IE	160/100	+	1+	N	N	N	-	CS		L	L	2.7	9	T	-	
59	GEETA	24	I	G2	A	35	B	P	1	IPE	150/100	+	2+	GR-1	N	N	-	PTVD		L	L	1.6	6	PT	20DAYS	
60	HASEENA	25	II	Primi	A	39	B	P	1	PPE	120/80	+	A	N	N	N	-	FTVD	-	L	L	2.6	9	T	2HRS	
61	VIJAYALAKSHMI	22	I	Primi	P	39	B	P	2	IPE	180/120	-	3+	N	N	N	-	FTVD	HELLP	L	L	3.3	9	T	2HRS	
62	LAXMI	18	II	Primi	A	32	B	P	-	IE	160/110	+	2+	N	N	N	-	PTVD	-	L	L	2	8	PT	2DAYS	
63	SAVITHRI	22	I	G2	P	37	B	P	1	IPE	180/100	+	2+	N	R	N	-	FTVD	PPH,OLI	L	L	1.9	7	T	10DAYS	
64	RENUKA	21	II	Primi	A	37	B	P	-	IE	170/120	+	4+	N	N	N	-	FTVD		L	L	2.8	9	T	-	
65	LAXMI DEVI	30	I	G3	A	34	B	P	-	IE	150/100	+	3+	N	R	N	-	PTVD	OLIGURIA	L	L	2	8	PT	2DAYS	
66	SAROJA	23	II	Primi	A	34	B	P	-	IE	150/110	+	1+	N	N	N	-	PTVD	-	L	L	1.8	9	PT	3DAYS	
67	RASHIDA	20	I	Primi	A	40	B	P	-	IE	160/100	+	2+	N	N	R	-	FTVD	-	L	L	2.5	8	T	1DAY	
68	SUNEETHA	20	II	Primi	P	37	B	P	-	IE	170/110	+	4+	N	R	N	-	FTVD		L	L	1.9	9	T	1DAY	
69	SHOBHA	22	II	Primi	A	40	B	P	-	IE	110/70	+	2+	N	N	N	-	FTVD	-	L	L	2.9	9	T	-	
70	PADMA	22	I	Primi	P	40	B	P	-	IE	180/120	+	3+	N	N	N	-	FTVD	-	L	L	2.7	9	T	-	
71	LALITHA	28	I	G3	A	36	B	P	-	IE	140/90	+	2+	N	N	N	-	PTVD	OLIGURIA	L	L	2.6	9	T	-	
72	MALLESHWARI	18	II	Primi	P	38	B	P	3	PPE	170/120	+	2+	N	N	N	-	FTVD	-	L	L	2	9	T	-	
73	VEENAMMA	18	II	Primi	P	32	UB	P	-	IE	140/110 +	+	2+	N	N	N	-	PTVD	-	L	L	1.6	9	PT	6DAYS	
74	SAVITA	34	I	G6	A	29	UB	P	6	APE	160/100	+	3+	N	R	R	-	PTVD	ASCITES,OLI	L	L	1.2	6	PT	28DAYS	
75	JAINATHBEE	20	II	Primi	A	36	B	P	-	IE	150/100	+	2+	N	N	N	-	PTVD	-	L	L	2.4	9	PT	-	
76	LAXMI	19	I	Primi	A	41	B	P	-	IE	140/100	+	3+	N	N	N	-	FTVD	-	L	L	2.7	9	T	-	
77	RAJESHWARI	21	II	Primi	A	40	B	P	-	IE	150/90	+	-	N	N	N	-	FTVD	-	L	L	2.8	9	T	-	
78	LAXMI	28	I	G3	P	34	B	P	-	IE	180/110	+	4+	N	R	R	-	CS	-	L	L	1.6	9	PT	18DAYS	
79	SANGEETHA	19	I	Primi	A	40	B	P	4	APE	160/100	+	3+	N	N	R	-	CS	-	L	L	3.4	8	T	2HRS	
80	VISHALI	29	II	G3	A	37	B	P	-	IE	160/110	+	4+	N	N	N	-	CS	-	L	L	3	9	T	2HRS	
81	PARVATHI	22	II	Primi	A	38	B	P	4	APE	100/70	-	1+	N	N	R	1+	CS	-	L	L	2.4	9	T	1DAY	II-I
82	BHAGYASHREE	26	I	Primi	A	41	B	P	-	IE	140/90	+	3+	N	N	N	-	CS	-	L	L	3	8	T	1DAY	
83	GEETHA	18	I	Primi	A	40	B	P	-	IE	170/110	+	3+	N	N	N	-	CS		L	L	2.7	9	T	-	
84	SANGEETHA	20	II	Primi	A	38	B	P	-	IE	140/100	+	2+	N	N	N	-	FTVD		L	L	2.8	8	T	1DAY	
85	SATAWWA	24	I	G2	A	39	B	P	-	IE	140/90	+	2+	N	R	N	-	FTVD	-	L	L	2.6	8	T	2DAYS	

86	PRIYANKA	21	I	Primi	A	39	B	P	-	IE	160/100	+	3+	N	R	N	-	CS	OLIGURIA	L	L	2.2	9	T	2DAYS	
87	SUJATHA	25	II	Primi	A	41	B	P	-	IE	140/90	+	1+	N	N	N	-	FTVD		L	L	2.5	9	T	-	
88	SHREEDEVI	25	II	G2	P	39	B	P	-	IE	150/110	+	3+	N	N	N	-	FTVD		L	L	2.4	9	T	-	
89	JAYASHREE	21	I	Primi	A	36	B	P	-	IE	160/110	+	2+	N	R	R	-	PTVD	-	L	L	2.5	9	PT	1DAY	
90	SAVITHA	24	I	G2	A	39	B	A	2	APE	110/70	+	A	N	N	N	-	CS		L	L	2.9	9	T	-	
91	ANNAPURNA	26	II	Primi	P	39	B	P	-	IE	150/100	+	A	N	N	N	-	FTVD		L	L	2.8	9	T	-	
92	SAVITHA	20	II	Primi	A	35	B	P	-	IE	150/100	+	3+	N	N	R	-	PTVD		L	L	1.2	8	PT	15DAYS	
93	SHAINAZ	22	I	G2	A	35	B	P	-	IE	180/100	+	4+	N	N	N	-	PTVD		L	SB	2	-	PT	-	
94	SHAMALABAI	20	I	Primi	A	36	B	P	4	APE	130/90	+	3+	N	N	N	-	CS		L	L	1.7	9	PT	10DAYS	
95	MEENAKSHI	20	II	G2	A	37	B	P	3	APE	160/110	+	4+	N	R	R	1+	FTVD		L	L	2	8	T	1DAY	II-I
96	SHOBHA	22	II	Primi	A	39	B	P	-	IE	140/100	+	1+	N	N	N	-	FTVD	-	L	L	2.6	9	T	-	
97	GANGAMMA	25	I	G2	A	38	B	P	3	PPE	170/120	+	1+	N	N	R	-	FTVD	-	L	L	2.5	9	T	2HRS	
98	REKHA	20	II	Primi	A	35	B	P	-	IE	130/100	+	2+	N	R	N	-	PTVD	-	L	L	2.4	9	PT	2HRS	
99	SAVITRI	21	II	Primi	A	37	B	P	-	IE	150/90	+	2+	N	N	N	-	FTVD	-	L	L	2.8	9	T	-	
100	POOJA BALA	20	I	Primi	A	35	B	P	3	APE	150/100	+	2+	N	N	N	-	CS	-	L	L	2.16	9	PT	2HRS	
101	PRATIKSHA	20	I	Primi	A	37	B	P	1	IPE	140/90	-	1+	N	R	N	-	FTVD	-	L	L	2.2	9	T	-	
102	ASHWINI	20	II	Primi	A	39	B	P	-	IE	150/110	+	2+	N	N	N	-	FTVD	-	L	L	2.54	9	T	-	
103	SABILA	22	II	Primi	A	33	B	P	2	APE	160/100	+	2+	N	R	N	-	CS	-	L	L	1.3	9	PT	15DAYS	
104	SHARANAMMA	30	I	G5	A	40	B	P	-	IE	170/110	+	2+	N	R	N	-	CS	OLIGURIA	L	L	3.1	8	T	1DAY	
105	SWETHA	27	I	G2A1	A	40	B	P	-	IE	150/110	+	2+	GR-1	R	N	-	CS	PPH	L	L	2	8	T	1DAY	
106	RAJUBAI	25	II	G2	A	38	B	P	1	APE	140/90	+	1+	N	N	N	-	FTVD	-	L	L	2.65	8	T	1DAY	
107	DEEPA	24	I	G3	A	41	B	P	-	IE	150/110	+	3+	N	N	N	-	FTVD	-	L	L	2.74	9	T	-	
108	KAVITHA	26	II	G3A2	A	39	B	P	-	IE	150/100	+	3+	GR-2	R	R	-	CS	-	L	L	3.8	9	T	-	
109	SAVITRI	30	II	Primi	A	36	B	P	-	IE	140/90	+	1+	N	N	N	-	CS	-	L	L	2.5	9	PT	-	
110	ASHWINI	21	I	G2	P	33	B	P	-	IE	160/120	+	3+	N	N	N	-	FTVD	-	L	L	1.5	9	PT	8DAYS	
111	RENUKA	22	II	Primi	P	35	B	P	-	IE	180/110	+	3+	N	N	N	-	CS		L	L	1.6	9	PT	7DAYS	
112	PAVITRA	21	I	Primi	A	39	B	P	-	IE	160/100	+	1+	N	N	N	-	CS		L	L	2.2	9	T	2HRS	
113	YELLAMMA	20	I	Primi	P	35	B	P	+	APE	110/70	-	1+	GR-1	N	N	-	CS		L	L	1.8	8	PT	2DAYS	
114	RENUKA	20	II	Primi	A	39	B	P	-	IE	160/100	+	2+	N	R	R	-	FTVD	PPH	L	L	1.9	9	T	4DAYS	
115	SAVITRI	25	II	G2	P	38	B	P	-	IE	150/90	+	1+	N	N	N	-	CS		L	L	2.3	9	T	-	
116	SURANDEVI	21	I	Primi	A	39	B	P	-	IE	150/100	+	3+	N	N	N	-	FTVD		L	L	2.7	8	T	2DAYS	
117	HASINA	22	I	Primi	A	36	B	P	-	IE	160/100	+	2+	N	N	N	-	PTVD		L	L	2.1	9	PT	2HRS	

118	KAVERI	21	II	Primi	A	37	B	P	-	IE	140/100	+	2+	N	R	N	-	CS	OLIGURIA	L	L	2.1	8	T	1DAYY	
119	GURUDEVI	19	I	Primi	A	35	B	P	-	IE	130/110	-	2+	N	N	N	-	CS		L	L	1.8	9	PT	4DAYS	
120	LAXMI	26	II	G5	A	40	B	P	-	IE	154/110	+	3+	N	N	N	-	CS		L	L	1.6	8	T	10DAYS	
121	REHKA	22	II	Primi	A	39	B	P	3	PPE	120/80	+	3+	N	N	N	-	FTVD	-	L	L	2.2	9	T	-	
122	SANA	23	I	G2	A	32	B	P	4	APE	150/100	+	3+	GR-2	R	N	-	PTVD	ABRUPTION	L	SB	1.5	-	PT	-	
123	BORAMMA	28	I	G2	A	39	B	P	-	IE	160/110	+	2+	N	N	N	-	CS		L	L	2.2	9	T	2HRS	
124	LAXMI	21	II	Primi	A	36	B	P	-	IE	150/110	+	3+	N	R	N	-	CS		L	L	2	9	PT	2DAYS	
125	MAKTHUMBI	18	I	Primi	P	39	B	P	-	IE	140/90	-	2+	N	N	N	-	FTVD		L	L	3.5	8	T	1DAY	
126	SUJATHA	19	II	Primi	A	39	B	P	-	IE	150/90	-	2+	N	N	N	-	CS		L	L	3.2	9	T	2HRS	
127	HEENA	20	I	Primi	A	39	B	P	-	IE	140/80	-	A	N	N	N	-	CS		L	L	2.8	9	T	2HRS	
128	ROOPA	20	II	Primi	A	40	B	P	-	IE	170/110	+	4+	N	R	N	-	FTVD		L	L	2.3	8	T	6DAYS	
129	GOURI	23	II	G2A1	A	37	B	P	-	IE	140/80	+	2+	N	N	N	-	FTVD		L	L	3	9	T	4HRS	
130	MARIYAMMA	19	I	Primi	P	32	B	P	3	APE	160/110	+	4+	N	N	N	-	PTVD		L	L	1.6	9	PT	7DAYS	
131	ASMA	20	I	Primi	A	39	B	P	-	IE	150/100	+	2+	N	N	N	-	FTVD	PPH	L	L	2	9	T	6HRS	
132	NEERAJA	24	II	Primi	A	34	UB	A	1	PPE	140/110	+	3+	N	N	R	-	PTVD	-	L	L	1.6	8	PT	10DAYS	
133	SHOBHA	22	I	Primi	A	41	B	P	5	APE	110/70	+	1+	N	N	N	-	FTVD		L	L	2.5	6	T	14DAYS	
134	NANDA	24	II	Primi	A	35	B	P	-	IE	130/100	+	2+	N	N	N	-	CS		L	L	1.9	9	PT	2DAYS	
135	NELAMMA	20	II	Primi	A	33	B	P	-	IE	120/70	+	3+	N	N	N	-	PTVD		L	L	1.4	8	PT	10DAYS	
136	SAVITA	19	I	Primi	A	39	B	A	4	APE	160/100	+	2+	N	R	R	-	CS	HELLP	L	L	2.1	7	T	8DAYS	
137	SHOBHA	25	II	Primi	A	35	B	P	-	IE	120/80	+	2+	N	N	N	-	PTVD	-	L	L	3	9	PT	-	
138	SAVITHA	25	I	Primi	P	28	B	P	6	APE	150/90	+	4+	GR-1	N	N	-	PTVD	-	L	L	1.2	7	PT	20DAYS	
139	SARASVATHI	24	I	Primi	A	35	B	P	-	IE	110/70	-	3+	N	N	N	-	PTVD	-	L	SB	1.4	-	PT	-	
140	SHAINAZ	20	II	Primi	A	37	B	P	-	IE	120/80	-	1+	N	N	N	-	CS	-	L	L	2.6	9	T	-	
141	SAVITRI	28	II	Primi	P	30	B	P	-	IE	180/100	+	2+	N	R	N	-	PTVD	-	L	SB	1	-	PT	-	
142	VIJAYA LAXMI	30	I	G2	A	32	B	P	-	IE	150/90	+	2+	N	N	N	-	CS	-	L	L	1.4	9	PT	10DAYS	
143	SAVITRI	22	II	Primi	A	40	B	A	8	APE	110/70	+	4+	N	R	R	-	CS	HELLP	L	L	2.8	9	T	-	
144	UMA	29	I	Primi	A	41	B	P	7	APE	120/70	+	3+	N	N	N	-	CS	-	L	L	1.9	6	T	14DAYS	
145	SAVITHRI	21	II	Primi	P	38	B	P	-	IE	160/110	+	4+	N	N	N	-	CS	-	L	L	2.5	9	T	-	
146	SUKANYA	25	I	G3	A	37	B	P	-	IE	160/100	+	4+	N	N	N	-	FTVD	-	L	L	3	8	T	3DAYS	
147	LAXMI	28	II	G2	A	35	B	P	-	IE	160/90	+	2+	N	N	N	-	PTVD	-	L	L	2.2	9	PT	-	
148	SANGETHA	26	I	G2	P	39	B	P	3	APE	160/100	+	4+	N	R	N	-	FTVD	-	L	L	2.6	9	T	-	
149	SUVARNA	24	I	Primi	A	39	B	P	-	IE	160/110	+	3+	N	N	N	-	CS	-	L	L	2.4	9	T	-	

150	SANGEETHA	25	II	Primi	A	40	B	P	-	IE	140/90	+	1+	N	N	R	-	FTVD	HELLP	L	L	2.6	9	T	-	
151	UMA	28	I	Primi	A	27	B	P	8	APE	160/100	+	2+	GR-1	N	N	-	PTVD		L	SB	1	-	PT	-	
152	RESHMA	20	II	Primi	A	38	B	A	4	APE	150/110	+	4+	N	R	N	1+	CS		L	L	2.3	9	T	2HRS	II-I
153	AMBIKA	21	I	Primi	A	34	B	A	6	APE	130/80	+	3+	GR-1	R	N	-	PTVD		L	L	1.8	9	PT	2DAYS	
154	ANITHA	20	II	Primi	A	37	B	P	-	IE	130/80	+	2+	N	N	N	-	CS		L	L	2.6	9	T	2HRS	
155	USHA	22	I	Primi	A	35	UB	P	5	APE	160/90	+	3+	N	N	N	-	PTVD		L	SB	1.4	-	PT	-	
156	SHANTAMMA	24	II	Primi	A	38	B	P	3	PPE	150/100	+	3+	N	R	N	-	FTVD	-	L	L	2.5	9	T	-	
157	KAVITHA	28	I	G2	A	39	B	P	-	IE	160/90	+	2+	N	N	N	-	FTVD		L	L	2.4	8	T	1DAY	
158	POOJA BALA	24	II	G3	P	40	B	P	2	APE	160/100	+	3+	N	N	N	-	FTVD		L	L	2.4	9	T	-	
159	NEELAMMA	27	II	G3	P	42	UB	P	-	IE	170/110	+	3+	N	R	N	-	FTVD	-	L	L	3.5	9	T	1DAY	
160	SAKKUBAI	21	I	Primi	A	39	B	P	-	IE	160/110	+	4+	N	R	R	-	FTVD	-	L	L	3	9	T	-	
161	SHARANAMMA	25	I	Primi	A	38	B	P	-	IE	15O/90	-	2+	N	N	N	-	FTVD	-	L	L	2.8	9	T	-	
162	PARUBAI	26	I	G2	A	36	B	P	-	IE	180/100	+	2+	N	N	N	-	FTVD	-	L	L	2.4	9	PT	2HRS	
163	JAYAMMA	24	II	Primi	A	39	B	P	-	IE	140/100	+	2+	N	N	N	-	FTVD	-	L	L	2.6	9	T	-	
164	RENUKA	21	II	Primi	A	37	B	P	-	IE	150/100	+	3+	N	N	N	-	FTVD	-	L	L	2.5	9	T	-	
165	PRIYANKA	22	I	G2	A	36	B	P	-	IE	130/100	-	1+	N	R	N	-	PTVD	-	L	L	2.3	9	T	2HRS	
166	IRAMMA	24	II	Primi	A	34	B	P	-	IE	140/110	+	2+	N	N	N	-	PTVD	-	L	L	2	8	PT	1DAY	
167	SAVITHA	26	I	G2	-	37	UB	P	3	PPE	150/100	+	2+	N	R	R	-	FTVD	OLIGURIA	L	L	2.6	8	T	1DAY	
168	REKHA	20	II	Primi	A	39	B	P	-	IE	140/90	+	2+	N	N	N	-	FTVD		L	L	2.5	9	T	-	

A Randomization Plan

From

http://www.randomization.com

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168. gr2_____

168 subjects randomized into 42 blocks

To reproduce this plan, use the seed 29254

along with the number of subjects per block/number of blocks

and (case-sensitive) treatment labels as entered originally.

Randomization plan created on Sunday, October 20, 2013 3:25:29 AM