Section: Obstetrics & Gynaecology

Original Research Article

A HOSPITAL BASED PROSPECTIVE ANALYTIC STUDY OF FETOMATERNAL OUTCOME IN SEVERE PREECLAMPSIA AT RURAL TERTIARY HEALTH CARE CENTRE OF SOUTHEAST RAJASTHAN

Sunita Dhaka[1], Sajna Shyoran[2], Ritu Gupta[3], Deepika Vyas[4]

[1,4]III[rd] Year Resident, Department of Obstetrics & Gynaecology, JMC, Jhalawar, Rajasthan, India.
[2]III[rd] Year Resident, Department of Obstetrics & Gynaecology, SN Medical College, Jodhpur, Rajasthan, India.
[3]Senior Professor, Department of Obstetrics & Gynaecology, JMC, Jhalawar, Rajasthan, India.

Received *: 30/07/2024*
Received in revised form *: 12/11/2024*
Accepted *: 30/11/2024*

Corresponding Author:
Dr. Sunita Dhaka,
IIIrd Year Resident, Department of Obstetrics & Gynaecology, JMC, Jhalawar, Rajasthan, India.
Email: sunitadhaka9878462809@gmail.com

DOI: 10.70034/ijmedph.2024.4.183

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2024; 14 (4); 992-997

ABSTRACT

Background: Preeclampsia is a disorder of pregnancy associated with new onset hypertension, which occurs most often after 20weeks of gestation and frequently near term. Delivery is the ultimate cure for severe preeclampsia & eclampsia, because of the worsening of fetal & maternal status. A high incidence of perinatal morbidity and mortality is primarily related to premature birth, uteroplacental insufficiency, and low birth weight. The aim of the study is to evaluate the Feto-Maternal Outcome of severe Preeclampsia.

Materials & Methods: This is a prospective analytical study done on 72 patients who are admitted in obstetrics gynaecology, at Jhalawar Medical College, Jhalawar, Rajasthan, India during one-year period. The study was done on the cases of severe preeclampsia fulfilling inclusion and an exclusion criterion's who are admitted in labour room. Patient's detailed history, symptoms and signs of severe preeclampsia, imminent eclampsia was noted. General and Obstetric examination were carried out. Details regarding mode of termination and indication for termination, intraoperative, postpartum complications were noted. Neonatal assessment was done by paediatrician. Fetal and Maternal complications were noted. Follow up of Mother and Neonate were done upto discharge.

Results: Out of the 72 patients in the present study, the maximum (55.55%) cases were in the age group of 25 to 34 years, most (51.38%) of them were Primigravida and most of the cases were ≥37 weeks of pregnancy (72.23%). The incidence of preeclampsia was higher in registered cases (83.33%). Only 38.03% delivered by normal vaginal delivery. While 61.97% delivered by C-Section. Twin pregnancy is one of the risk factors for preeclampsia. Out of the total 4.16% had twin pregnancy. One of the most important risk factors is previous history of hypertension which was seen in 5.55% females. Out of the total 97.18% were live birth and 2.72% died intrauterine in our study. Out the total 12 admitted in NICU respiratory distress syndrome was the most common reason (41.66%), 33.33% of them were shifted to NICU because of severe IUGR and 25% shifted due to asphyxia.

Conclusion: This study thus confirms the manifestations of preeclampsia as a cause of both significant maternal and perinatal morbidity and mortality.

Keywords: Fetomaternal outcome, Pre-eclampsia, Perinatal outcome, Outcome.

INTRODUCTION

Preeclampsia is a multisystem disorder involving placenta, kidney, liver, cardiovascular and neurovascular system, occurring exclusively during pregnancy.[1] Preeclampsia complications do arise in about 3 % of pregnancies, and all hypertensive

disorders affect about 5–10 % of pregnancies. In India the incidence of preeclampsia is 7.6% during pregnancy of which 3.3% is severe preeclampsia.[2] In India hypertensive disorders account for the third most important cause of maternal mortality.[3]

Preeclampsia is a principal cause of fetal morbidity and mortality, also the leading reason of maternal ICU admissions, and responsible for 15–20% of maternal deaths worldwide.[4] A majority of deaths in developing countries result from eclampsia, while in developed countries, complications of preeclampsia are more often the cause.

Severe Preeclampsia can lead to multiple life-threatening complications like eclampsia, cerebral haemorrhage, cardiovascular complications, hepatic failure, acute renal failure, pulmonary oedema, ARDS (Adult Respiratory Distress syndrome), DIC (Disseminated Intravascular Coagulation), HELLP syndrome (Haemolysis, Elevated Liver enzymes, Low Platelet), retinal detachment, cortical blindness, hypoxic cerebral damage and even maternal death.[5]

Fetal complications are mainly due to uteroplacental insufficiency leading to IUGR (Intrauterine Growth Restriction), low birth weight babies, IUFD (Intrauterine Fetal death) and complications due to prematurity. There are still no widely accepted biochemical markers for early detection of Preeclampsia but some maternal and pregnancy characteristics have been identified as risk factors, these are young and nulliparous, previous history of preeclampsia, maternal age over 40, multiple gestation, molar pregnancy, pregestational diabetes, vascular, endothelial or renal diseases, maternal smoking, obesity and certain genetic factors.[6]

Preeclampsia is a disorder of pregnancy associated with new onset hypertension, which occurs most often after 20weeks of gestation and frequently near term. Although often accompanied by new onset proteinuria, hypertension and other signs or symptoms of preeclampsia may present in some women in the absence of proteinuria.[7] Reliance on maternal symptoms may be occasionally problematic in clinical practice. Right upper quadrant or epigastric pain is thought to be due to periportal and focal parenchymal necrosis, hepatic cell oedema or Glission's capsule distension, or a combination. However, there is not always a good correlation between the hepatic histopathology and laboratory abnormalities.[8] Similarly, studies have found that using headache as diagnostic criteria for preeclampsia with severe feature is unreliable and non-specific. Of note, in the setting of a clinical presentation similar to preeclampsia, but gestational ages earlier than 20 weeks, alternative diagnoses should be considered, including but not limited to thrombotic thrombocytopenia purpura, haemolytic-uremic syndrome, molar pregnancy, renal disease or autoimmune disease.

The etiology of preeclampsia is unknown: numerous models have attempted to explain its roles in the pathogenesis of immunology, cytokines, and growth factors, including tumor necrosis factor, endothelial damage, platelet dysfunction, and genetics has been implicated in the pathogenesis of preeclampsia.[9]

Around 70% of all severely preeclamptic patients admitted to high dependency unit develop multi-organ dysfunction. Maternal complications associated with preeclampsia include HELLP syndrome (10-25%), acute kidney injury (AKI) (1-5%), pulmonary oedema (2-5%) and placental abruption (1-4%), eclampsia (<1%).

The fetus may be small for gestational age or IUGR with decreased fetal movements and oligohyramnios. Severe preeclampsia is a significant risk factor for intrauterine fetal demise, with an estimated stillbirth rate of 21/1000.[10] Further, preterm delivery increases risks of neonatal death and serious morbidity from prematurity.

Delivery is the ultimate cure for severe preeclampsia & eclampsia, because of the worsening of fetal & maternal status. Proper obstetric care is one of the cornerstones of the management, undue delay in the delivery of the fetus & placenta may adversely affect fetal & maternal outcomes, Hence, the abdominal route of delivery when the vaginal route is not imminent will help in improving the maternal/fetal outcome.[11] the rate of caesarean delivery is increased because of increased rates of induction of labor.[12] A high incidence of perinatal morbidity and mortality is primarily related to premature birth, uteroplacental insufficiency, and low birth weight. The aim of the study is to evaluate the Feto-Maternal Outcome of severe Preeclampsia.

MATERIALS AND METHODS

This is a prospective analytical study done on 72 patients who are admitted in obstetrics gynaecology, at Shrimati Heera Kunwar Baan Mahila Hospital in association with Jhalawar Medical College, Jhalawar, Rajasthan, India during January 2021-December 2021 period.

Inclusion Criteria

- Gestational age ≥ 34 weeks
- Systolic BP ≥ 160 mmHg
- Diastolic BP ≥110 mmHg
- With or without any of the following
- Persistent headache
- Epigastric pain
- Blurred vision
- Eclampsia
- Elevated liver enzymes
- Low Platelets
- Maternal oligouria
- Abruptio Placenta
- Oligohydomnios
- IUGR

Exclusion Criteria

- Gestational age < 34 weeks
- Preexisting chronic renal and hepatic disease
- Idiopathic haemolytic anaemia
- Idiopathic thrombocytopenic purpura

- Epilepsy
- Chronic hypertension
- Thyrotoxicosis
- Heart diseases

Methods

The study was done on the cases of severe preeclampsia fulfilling inclusion and an exclusion criterion's who are admitted in labour room. Patient's detailed history, symptoms and signs of severe preeclampsia, imminent eclampsia was noted. General and Obstetric examination were carried out. Urine investigation and ANC profile were done on admission and repeated based upon the progression of the disease. Obstetric ultrasound was performed in patients. In case of any abnormalities like patient's condition deterioration, oligohydromnios and IUGR then expectant management were discontinued and planned for termination of pregnancy.

Details regarding treatment (Antihypertensives, Mgso4, steroids) were noted. Details regarding mode of termination and indication for termination, intraoperative, postpartum complications were noted. Neonatal assessment was done by paediatrician. Fetal and Maternal complications were noted. Follow up of Mother and Neonate were done upto discharge.

RESULTS

Out of the 72 patients in the present study, the maximum (55.55%) cases were in the age group of 25 to 34 years, most (51.38%) of them were Primigravida and most of the cases were ≥37 weeks of pregnancy (72.23%). The incidence of preeclampsia was higher in registered cases (83.33%). [Table 1]

The most common complications of preeclampsia in mother was PPH (12.5%) females out of which 5 females had atonic PPH, 2 had traumatic PPH followed by 6.94% had abruption and 5.55% had eclampsia as complication. Two patients died because of preeclampsia. One died on admission due to respiratory distress and other one due to postpartum cardiac arrest collapse just after second stage of labour. Wound infection was seen in 5.55% females and one case each of pulmonary oedema and postpartum hypotension was seen. Ascites was seen as complication in 4.16% females. 56.94% had no complications.

Our study shows that mode of delivery of females with preeclampsia. Only 38.03% delivered by normal vaginal delivery. While 61.97% delivered by C-Section. [Figure 1]

Foetal distress was the most common indication for C-section (40.09%). 9.09% were operated because of previous LSCS and 6.81% because of abruption and failure of induction. 2.27% i.e. 1 case each of APE, breech and breech with foetal distress, Poor BISHOP score, PPROM with foetal distress, Precious pregnancy, Severe IUGR, Severe IUGR with foetal distress, Severe PE with foetal distress, Twins with 1st breech, Twins with foetal distress, Twins with PE were indications of C-section. [Table 3]

Twin pregnancy is one of the risk factors for preeclampsia. Out of the total 4.16% had twin pregnancy. One of the most important risk factors is previous history of hypertension which was seen in 5.55% females. While the proportion of females with history of taking antihypertensives is 30.55% in our study. [Table 4]

In this study shows that dizziness was the most common complaint (22.41%) followed by vomiting (20.68%). Headache was presented by 17.24% patients. 8.62% females presented with bleeding per vaginum and epigastric pain and 12.06% presented with nausea. 3.44% females complained of nervousness and decreased foetal movements. Blurring vision and bleeding nose was presented by 1.72% of the all the females. [Figure 2]

Out of the total 97.18% were live birth and 2.72% died intrauterine in our study. [Table 5]

Our study shows that 17.40% were admitted in NICU after birth and 82.60 % were shifted to mothers' side after birth. Out the total 12 admitted in NICU respiratory distress syndrome was the most common reason (41.66%), 33.33% of them were shifted to NICU because of severe IUGR and 25% shifted due to asphyxia. [Table 6]

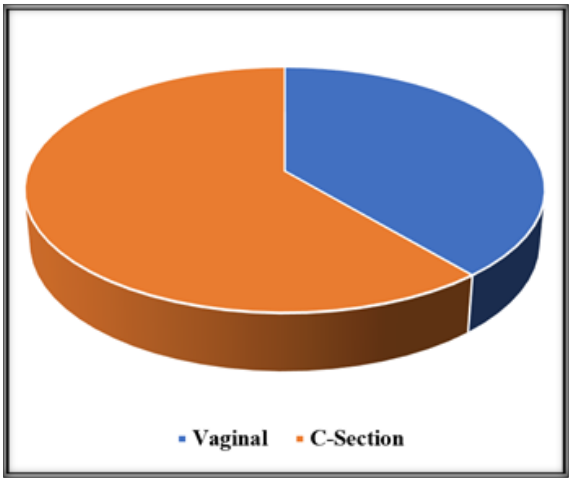

Figure 1: Mode of delivery

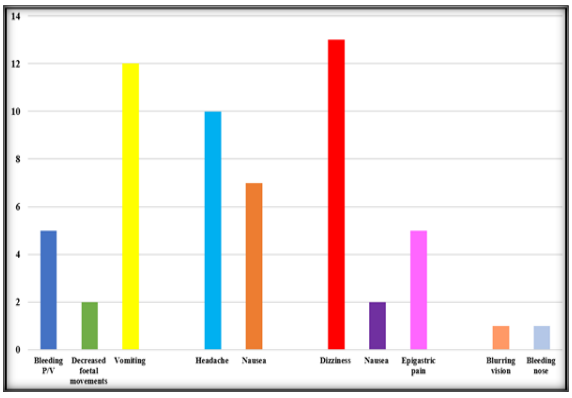

Figure 2: Presenting Complaints

Table 1: Demographic and antenatal background

Demographic profile	No. of cases (N=72)	Percentage (%)
Age (yrs)		
15-24	15	27.17%
25-34	40	55.55%
>35	17	23.60%
	Gravida	
1	37	51.38%
2	18	25%
3	13	20.83%
4	1	1.39%
>4	3	4.16%
	Booking status	
Booked	60	83.33%
Unbooked	12	16.67%
	BMI (Kg/m^2)	
Underweight (<18.5)	4	5.55%
Normal (18.5-24.9)	40	55.55%
Overweight (25-29.9)	21	29.16%
Obese (>30)	7	9.72%
Gestational age		
34-36weeks	20	27.77%
≥37weeks	52	72.23%

Table 2: Maternal outcome

Maternal outcome	Number (72)	%
Abruption	5	6.94%
Eclampsia	4	5.55%
Pleural effusion	2	2.77%
PPH	9	12.5%
Ascites	3	4.16%
Death (respiratory distress and postpartum cardiac arrest)	2	2.77%
HELLP	1	1.39%
Postpartum hypotension	1	1.39%
Pulmonary oedema	1	1.39%
Wound infection	4	5.55%
No complications	41	56.94%

Table 3: Indication for C-Section

	Number (44)	%
Abruptio placenta	3	6.81%
APE	1	2.27%
Breech	1	2.27%
Breech and foetal distress	1	2.27%
CPD	1	2.27%
Foetal distress	18	40.09%
Induction	3	6.81%
NPOL	2	4.54%
Poor BISHOP score	1	2.27%
PPROM with foetal distress	1	2.27%
Precious pregnancy	1	2.27%
Severe IUGR	1	2.27%
Severe IUGR with foetal distress	1	2.27%
Severe PE with foetal distress	1	2.27%
Twins with 1st breech	1	2.27%
Twins with foetal distress	1	2.27%
Twins with PE	1	2.27%
Previous LSCS	4	9.09%

Table 4: Risk factors for pre-eclampsia

Risk factors		Number (72)	%
Twin pregnancy	**Yes**	3	4.16%
	No	69	97.22%
Previous history of hypertension	**Yes**	4	5.55%
	No	68	94.45%
History of taking antihypertensives	**Yes**	22	30.55%
	No	50	69.44%

Table 5: Outcome

	Number	%
Live birth	69	97.18%
IUD	2	2.72%
TOTAL	71	100%

Table 6: Reason for NICU admission

	Number	%
SEVERE IUGR	4	33.33%
RDS	5	41.66%
ASPHYXIA	3	25%
Total	12	100%

DISCUSSION

Severe preeclampsia is associated with relatively high rate of maternal morbidity and mortality as well as high perinatal morbidity and mortality. This study focus on small cohort of women who develop severe preeclampsia near term.

In this study most, women with severe preeclampsia were between the age range of 15-34years, mean age is 23years, thus demonstrating that in this study younger women were more affected by severe preeclampsia. But in the studies done by Brown MA and Buddle ML,[13] D. R. Hall,[14] the mean age was 26 years. This variation may be due to early marriage age in Rajasthan.

Although preeclampsia is regarded as a disease of first pregnancy, the risk of preeclampsia increases in those with limited sperm exposure with the same partner prior to conception and a previous pregnancy with same partner is associated with reduced risk of preeclampsia, however this protective risk is lost with a change of partner.

More than half of the women in this study were nulliparous 37(51.38%). Preeclampsia is common in first pregnancy. Brown MA and Buddle ML,[13] said preeclampsia is predominant in nulliparous.

These findings however similar with those by Conde-Agudelo and Belizan, in which they found that nulliparity, was associated with an increased risk of preeclampsia.[15]

Only 28 (38.88%) of the women in our study group had risk factors, which include twins, history of hypertension in previous pregnancy and taking antihypertensive in present pregnancy. In the study by D. R. Hall,[14] 36% of the women had risk factors.

In this study 3 (4.16%) twin, 4 (5.55%) had a history of hypertension in previous pregnancy and 22 (30.55%) taking antihypertensive in present pregnancy.

Obesity and overweight are significant risk factors worldwide, contributing to an increased risk of cardiovascular disease, type 2 diabetes and reduced life expectancy. Basu et al. reported a prevalence of BMI of 28±5.9 in a South African pregnant adolescent population. Compared to their study, the incidence of obesity in our study is low.[16] Of note we did not restrict our study to an adolescent population.

Notably in our study, women who were with normal BMI 40 (55.55%) were more likely to be diagnosed with preeclampsia.

The National Center for Health Statistics, Luke and associates (2008) analyzed 316,696 twin pregnancies. These investigators noted that the risk for pregnancy-associated hypertension was significantly increased with twins (8 percent).[17]

Almost 60(83.33%) women in this study were booked either at our institution or outside. Adequate antenatal care has an important role in reducing the complications by early detection and appropriate management. Though more than half of the patients in this study were booked, early detection of gestational hypertension was not made because one or two recordings of high blood pressure at early gestational age was not taken into serious consideration and also because of unawareness of the women.

Gestational age in weeks when they were diagnosed. 27.77% were diagnosed between 34-36 weeks and 72.23% were diagnosed at and after 37 weeks. The reason of developing severe preeclampsia more at term might be due to increase heath care services so getting effective treatment in early weeks of gestation. Dehram et al,[18] showed improvement in neonatal survival with increasing gestational age.

Though delivery is the ultimate cure for preeclampsia, fetal outcome should be taken into consideration in the absence of maternal,[19,20] complication. Almost 61.97% of the women in this study were delivered by caesarean section and most common cause is fetal distress (40.09%). This rate is higher than that reported by Mashiloane and Moodley.[21]

Ultimate goal in the management of severe preeclampsia must first be the safety of the mother and second the delivery of a live infant who will not require prolonged neonatal care.

In our study maternal morbidity and mortality was seen in 43.06%. PPH, abruption and eclampsia were highest accounting to 9(12.5%), 5(6.94%) and 4(5.55%) respectively. Other complications were wound infection (5.55%), ascites (4.16%), pleural effusion (2.77%), HELLP (1.39%), postpartum hypotension (1.39%) and pulmonary oedema (1.39%).

The increased incidence of perinatal morbidity and mortality seen in pregnancies complicated by preeclampsia, although complex and multifactorial,

is due to the need for premature delivery and uteroplacental insufficiency resulting in compromised blood supply to the fetus. In this study live birth was 69(97.18%) and IUD 2(2.72%). Moodley et al,[22] demonstrated in their study increased survival rates with increasing gestational age.Out of them 12(17.40%) admitted in NICU with following reasons severe IUGR 4(33.33%), RDS 5(41.66%), asphyxia 3(25%).

CONCLUSION

This study thus confirms the manifestations of preeclampsia as a cause of both significant maternal and perinatal morbidity and mortality. We also found that a large number of the women had severe morbidity associated with severe preeclampsia and premature delivery is still the leading cause of perinatal morbidity and mortality. The differences with other studies may be attributed to the small number of patients recruited, racial differences, socioeconomic status and some certain demographic parameters such as parity and age. In addition some may be attributable to the fact that our hospitals serve as referral obstetric centres for extended number of primary care facilities of the surrounding semi urban areas.

REFERENCES

1. Steegers EA, von Dadelszen P, Duvekot JJ, Pijnenborg R. Pre-eclampsia. Lancet 2010; 376:631–44. (Level III)
2. M.K. Swamy, K. Patil, and S. Nageshu, "Maternal and perinatal outcome during expectant management of severe pre-eclampsia between 24 and 34 weeks of gestation," The Journal of Obstetrics and Gynecology of India,2012;62(4):413–18.
3. Govt. of India (Sample Registration System) Maternal mortality in India, 1997-2003. Trends, causes and risk factors. Registrar General of India, New Delhi in collaboration with Centre for Global Health Research, Toronto.
4. E. J. Roccella, "Report of the national high blood pressure education program working group on high blood pressure in pregnancy," The American Journal of Obstetrics and Gynaecology,2000;183(1): S1–S22
5. Hutcheon JA, Lisonkova S, Joseph KS. Epidemiology of preeclampsia and the other hypertensive disorders of pregnancy. Best Pract Res Clin Obstet Gynaecol 2011
6. Conde-Agudelo A, Villar J, Lindeheimer M. World Health Organization systematic review of screening tests for preeclampsia. Obstet Gynecol. 2004;104(6):1367-91
7. Homer CS, Brown MA, Mangos G, Davis GK. Non-pro-teinuric pre-eclampsia: a novel risk indicator in women with gestational hypertension. J Hypertens2008; 26:295– 302. (Level II-3)
8. Barton JR, Riely CA, Adamec TA, Shanklin DR, Khoury AD, Sibai BM. Hepatic histopathologic condition does not correlate with laboratory abnormalities in HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet count). Am J ObstetGynecol1992; 167:1538–43. (Level III)
9. Conde-Agudelo A, Villar J, Lindeheimer M. World Health Organization systematic review of screening tests for preeclampsia. Obstet Gynecol. 2004;104(6):1367-91.
10. Lewis G. The Confidential Enquiry into Maternal and Child Health (CEMACH). Saving Mothers Lives: reviewing maternal deaths to make motherhood safer – 2003-2005. The Seventh Report on Confidential Enquiries into Maternal Deaths in the United Kingdom. London: CEMACH; 2007.
11. Akinola OI, Fabanwa AO, Gbagesin A, Ottun TA & Kusemiju OA. Improving [8]the clinical outcome in cases of eclampsia: the experience at Lagos state university teaching hospital, Ikeja. The Internet Journal of Third World Medicine. 2008;6(2):2.
12. Sibai BM, Caritis S, Hauth J, Lindheimer MD, MacPherson C, Klebanoff M, et al. Hypertensive disorders in twin versus singleton gestations. National Institute of Child Health and Human Development Network of Maternal-Fetal Medicine Units. Am J Obstet Gynecol 2000; 182:938-42.
13. Brown MA, Buddle ML Hypertension in Pregnancy: Maternal and neonatal outcome according to laboratory and clinical features. Med J Aust.1996; 165(7): 360-7.
14. D.R. Hall, H.J. Odendaal, G.F. Kirsten, J. Smith, D. Grove. Expectant management of early onset, Severe pre-eclampsia maternal and perinatal outcome. BJOG 2000: 107: 1252-64.
15. Sibai BM. Eclampsia: VI. Maternal-perinatal outcome in 254 consecutive cases. Am J Obstet Gynecol 1990; 163(3):1049-54.
16. Basu JK, Basu D. Obesity and its outcomes among South African pregnant adolescents. South Afr J Epidemiol Infect 2012; 27(1):36-38.
17. Luke B, Brown MB: Maternal morbidity and infant death in twin vs triplet and quadruplet pregnancies. Am J Obstet Gynecol.2008; 198:401.
18. Allen VM, Joseph KS, Murphy KE, Magee LA, Ohlsson A. The effect of hypertensive disorders in pregnancy on small for gestational age and stillbirth: A population based study. BMC Pregnancy and childbirth 2004; 4: 17.
19. Dekker G.Sibai B. Primary, secondary, and tertiary prevention of pre- eclampsia. Lancet 2001;357: 209-15.
20. Walker RR. Pre -eclampsia. Lancet 2000;356: 1260 -65.
21. Mashiloane CD, Moodley J. Induction or Caesarean section for pre-term preeclampsia. Journal of Obstetrics and Gynecology 2002; 22(4): 353-56.
22. Moodley J, Koranteng S, Rout C. Expectant management of early onset severe preeclampsia in Durban. SAMJ 1993; 83:584-87.