Pre-Eclampsia Progressed to Eclampsia Leading to Intra Uterine Death Associated with Berger’s Disease: A Case Study

Polamarasetti Sai Kiran*, Dhanalakshmi Surada, Sai Anusha Lakkoju, Manukonda Raji Priscilla, Sudeep Molli

ABSTRACT
Preeclampsia is a disorder of pregnancy characterized by hypertension, proteinuria, vasospasm and a disease of the maternal endothelium that occurs after 20 weeks period of gestation. If it is not properly managed, it may result in seizures at which point it is known as eclampsia. Inga nephropathy is a renal disorder in which antibodies called Inga build up in the renal tissue. Inga nephropathy usually progresses slowly over many years. This is also one of the underlying causes for the occurrence of the hypertension and ultimately complicates the pregnancy by the uncontrolled blood pressure (Eclampsia). In this present case a 24 year old female G1A1 with 23 weeks Period of Gestation (POG) and who was a known hypertensive was admitted in King George Hospital with the chief complaints (c/o) of headache, vomiting since 3 days and edema since 15 days. She was diagnosed with eclampsia and was on irregular medication for hypertension. She was later aborted and further developed post-partum acute kidney injury which progressed to Chronic Kidney Disease and ESRD. Later, she was also diagnosed with Inga Nephropathy. She was given with appropriate medication and counseling was done about status of the disease and the importance of medication adherence.

Key Words: IgA nephropathy, medication adherence, period of Gestation, preeclampsia and vascular endothelial malfunction

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INTRODUCTION
DEFINITIONS
Preeclampsia (PE) is a disorder of pregnancy characterized by high blood pressure and a large amount of protein in the urine [1]. Preeclampsia is a disorder of widespread vascular endothelial malfunction and vasospasm that occurs after 20 weeks’ gestation and can present as late as 4-6 weeks post-partum. It is clinically defined by hypertension and proteinuria, with or without pathologic edema [2]. If left untreated, it may result in seizures at which point it is known as eclampsia [3].

Preeclampsia superimposed on chronic hypertension is diagnosed when new unexplained proteinuria develops after 20 week in a woman known to have hypertension or when BP increases or signs of severe preeclampsia develop after 20 week in a woman known to have hypertension and proteinuria [4].

IgA nephropathy (IgAN), also known as Inga nephritis, Berger’s disease or synpharyngitic glomerulonephritis which is a disease of the kidney (or nephropathy), specifically it is a form of glomerulonephritis or an inflammation of the glomeruli of the kidney [5].
Preeclampsia, a hypertensive disorder of pregnancy is estimated to complicate 2%–8% of pregnancies and remains a principal cause of maternal and fetal morbidity and mortality. Preeclampsia may present at any gestation but is more commonly encountered in the third trimester. Multiple risk factors have been documented such as primigravida, diabetes, connective tissue disorders, obesity [6], Chronic renal disease, Chronic hypertension, Homozygosity for angiotensinogen gene and Heterozygosity for angiotensinogen gene [7,8]. The pathophysiology of preeclampsia likely involves both maternal and fetal/placental factors. Abnormalities in the development of placental vasculature early in pregnancy may result in relative placental underperfusion/hypoxia/
ischemia, which then leads to release of antiangiogenic factors into the maternal circulation that alter maternal systemic endothelial function and cause hypertension and other manifestations of the disease [9]. Hindrance of cerebral blood flow regulation results in the inhibition of cerebral perfusion, vessels become dilated with increased permeability, and cerebral edema occurs, resulting in ischemia and encephalopathy [9]. Generally Inga Nephropathy is also one of the reason for the complication of the pre-eclampsia to eclampsia and postpartum acute kidney injury (AKI) to the End Stage Kidney Disease (ESKD). The pathogenesis involved in the occurrence of IgAN is the mesangial deposition of Inga, which is predominantly polymeric Inga of the IgA1 subclass (pIgA1). Co-deposits of IgG and complement are also commonly seen; however, these are not mandatory for disease activity or progression [10].

**MANAGEMENT:** Management of pre-eclampsia/eclampsia consists of prevention or treatment of seizures, control of blood pressure and ultimately, delivery of the infant [11].

**TREATMENT FOR PRE-ECLAMPSIA:** The World Health Organization recommends that women with severe hypertension during pregnancy should receive treatment with anti-hypertensive agents [12]. ACE inhibitors and angiotensin receptor blockers are contraindicated as they affect fetal development [13]. Drugs such as Hydralazine, Labetalol, Nicardipine, Diuretics, Sodium Nitroprusside and Magnesium Sulfate [14-18].

**Magnesium Sulfate:** The drug of choice for the prevention and control of maternal seizures in patients with severe preeclampsia or eclampsia during the peripartum period is i.v. magnesium sulfate. Therapeutic serum magnesium levels cause cerebral vasodilation, thereby reversing the ischemia produced by cerebral vasospasm during an eclamptic episode [19].

**TREATMENT FOR ECLAMPSIA:** Drug treatment in eclampsia is in the following (Table 1) [20].

<table>
<thead>
<tr>
<th>Table 1: Standard Drug Treatment for Eclampsia [20].</th>
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<tbody>
<tr>
<td><strong>Drug</strong></td>
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<tr>
<td>Seizure control</td>
</tr>
<tr>
<td>Diazepam</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>Lorazepam</td>
</tr>
<tr>
<td>Magnesium sulphate</td>
</tr>
<tr>
<td>Blood pressure control</td>
</tr>
<tr>
<td>Hydralazine</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>Labetalol</td>
</tr>
<tr>
<td>Fluids</td>
</tr>
<tr>
<td>Crystalloid</td>
</tr>
</tbody>
</table>
DRUG TREATMENT IN ECLAMPSIA [20]:
Delivery: Delivery is indicated urgently if there is evidence of severe, progressive disease such as headache, blurred vision, scotomata, epigastric pain, daily blood pressure greater than 110 mm Hg, clonus, coagulopathy, raised creatinine, or liver enzymes [21].

MANAGEMENT OF InGa NEPHROPATHY:
No specific therapy is available for IgAN. Lowering blood pressure and renin-angiotensin system inhibition remain the cornerstone of management [22]. Angiotensin-converting enzyme inhibitors (ACEIs) are the preferred agents for lowering blood pressure. Angiotensin II receptor blockers (ARBs) should be used for patients who cannot tolerate ACEIs [23]. Steroid therapy is associated with a decrease of proteinuria and with a statistically significant reduction of the risk of ESKD [24]. ESKD requires dialysis or transplantation. Recurrence of IgAN after kidney transplantation is an important cause of graft failure [25].

CASE STUDY: A 24years old femaleG2A1 with 23 weeks POG brought with the chief complaint of headache and vomiting since 3 days.

Patient was apparently normal up to 4th month of gestation. She was detected to having hypertension and on the treatment Depin 10mg BD. But she was on irregular treatment.

History of (h/o) pedal edema since 15 days. c/o headache vomiting since 3days for which she consulted outside and recorded with high blood pressure level(160/100mm of Hg) and so given with Magnesium sulphate and referred to this hospital.
H/o of double vision and headache since yesterday and decreased urine output since one day.
H/o of vomiting (5 episodes) since 9 pm and subsided on medication Ondansetron.

Perceiving fetal movements.

Obstetric history: 1st pregnancy—spontaneous abortion on 3rd month
2nd pregnancy—conceived spontaneous, pregnancy confirmed in 2nd month.

Patient diagnosed to have hypertension on 4th month and on irregular medication then 2TT doses were taken and taking IFA prophylaxis.

Known case of hypothyroidism diagnosed in 2nd month and on Tab. Thyronorm 50 mcg
H/o pedal edema since 7th month.

Gynaec history: Attained Menarche- 13 years
Married Life- 1 year, non-consanguineous
Menstrual history- 3-5/30 days/ regular menstrual flow/clotless/painless
Last Menstrual Period - 9/3/2016

Past history:
No h/o Diabetes/bronchial asthma/ epilepsy/tuberculosis/jaundice

Personal history: Takes mixed diet, bowel and bladder movements regular, sleep and appetite are found to be normal

General examination: Pallor; Icterus; Cyanosis; Clubbing; Edema

No thyromegaly, breast normal and spine normal.

Abnormal laboratory investigations:
Hemoglobin: 10 gm% (normal-11 to 14)
Serum creatinine: 8.4 mg/dL (normal- 0.6 to 1.4)
Blood urea: 89mg/dL (normal- 14 to 45)

Referred from private hospital with the complaint of chronic hypertension and superimposed gestational hypertension with signs of imminent eclampsia (vomiting) with blood pressure 160/110mm of Hg.

From the above subjective and objective findings patient was diagnosed with PRE-ECLAMPSIA PROGRESSING TO ECLAMPSIA WITH ACUTE KIDNEY INJURY.

TREATMENT:

On 1st day of admission, patient was found to be conscious and coherent, temperature was afebrile, pulse rate(PR)-82/min, blood pressure(BP)-160/110mm of Hg, Respiratory rate(RR)-18/min, P/A uterus 22-23 weeks and uterine relaxed. She was prescribed with Cap.Depin (nefidipline) 10mg TID and thyronorm (levothyroxine sodium) 50mcg OD. Blood pressure monitoring done and BP reduced to 120/80 mm of Hg after the administration of Cap. Depin.

On 2nd day of admission, patient was found to be conscious and coherent, temperature was afebrile, pulse rate (PR)-86/min, blood pressure (BP)-140/90mm of Hg, Respiratory rate(RR)-18/min and uterine relaxed. She was prescribed with Cap. Depin
(nifedipine), 10mg TID and thyronorm 50mcg OD, Inj. Zofer IV BD, Inj. Pantoprazole 40mg IV OD and intravenous fluid 2 units normal saline and 1 unit dextrose normal saline. No imminent symptoms were seen. On the same day morning 8:30 AM patient exhibited pedal edema, facial edema and tongue was found to be pinkish and moist. At 4:30 PM anasarca is seen so consulted to nephrologist and prescribed with Inj. Lasix (furosemide) 2cc IV BD and low potassium diet.

On 3rd day, patient had an episode of seizures and also exhibited diplopia (showing imminent symptoms), conscious and coherent, pedal edema, facial puffiness, BP-110/70 mm of Hg, PR-84/min and uterine relaxed. Patient was prescribed with Tab. Thyronorm 50mcg OD, Cap. Depin 10 mg TID, Inj. Lasix 2cc IV BD, low potassium diet and MgSO₄ therapy for seizures as given in the following (Table 2). MgSO₄ dosage:

First dose on right buttock given in the private hospital at 12:30 am.

<table>
<thead>
<tr>
<th>Dose</th>
<th>Time</th>
<th>Blood pressure</th>
<th>Respiratory rate</th>
<th>Knee jerk</th>
<th>Urine output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second dose on left buttock</td>
<td>4:30 am</td>
<td>110/70 mm of Hg</td>
<td>16 bpm</td>
<td>Positive</td>
<td>----</td>
</tr>
<tr>
<td>Third dose on right buttock</td>
<td>8:30 am</td>
<td>110/70 mm of Hg</td>
<td>18 bpm</td>
<td>Positive</td>
<td>1000 ml</td>
</tr>
<tr>
<td>Fourth dose on left buttock</td>
<td>12:30 pm</td>
<td>120/80 mm of Hg</td>
<td>16 bpm</td>
<td>Positive</td>
<td>300 ml</td>
</tr>
<tr>
<td>Fifth dose on right buttock</td>
<td>4:30 pm</td>
<td>150/80 mm of Hg</td>
<td>16 bpm</td>
<td>Positive</td>
<td>600 ml</td>
</tr>
<tr>
<td>Sixth dose on left buttock</td>
<td>8:30 pm</td>
<td>130/70 mm of Hg</td>
<td>18 bpm</td>
<td>Positive</td>
<td>300 ml</td>
</tr>
</tbody>
</table>

On 4th day, patient did not exhibited any imminent symptoms, conscious and coherent, pedal edema and facial edema and found to be pallor. Temperature was normal, PR-82/min, BP-140/70 mm of Hg and uterine relaxed. Same drugs continued. On the same day, fetus along with placenta expelled. So Oxytocin 10 IU is given. Cavity explored for any retrained products, hemostasis secured. 600mcg of Misoprostol kept per rectally.

**IMMEDIATE POST ABORTAL PERIOD**

On 5th day, patient was conscious and coherent, pallor, PR-58/min, BP-140/90 mm of Hg, uterine retracted well and there is no active bleeding. Patient was given Cap. Amoxycillin 500 mg TID, Tab. Ranitidine BD, Tab. Paracetamol 500mg BD, Tab. B complex/calcium/iron folic acid OD, Tab. Nicardia retard (nifedipine) 20 mg BD. Lasix 40mg OD was added.

On 7th day, patient was conscious and coherent, pallor, PR-82/min, BP-100/60 mm of Hg, uterine retracted well and there is no active bleeding. Patient was given Cap. Amoxycillin 500 mg TID, Tab. Pantoprazole OD, Tab. Calcium 500 mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Nicardia retard (nifedipine) 20 mg BD Inj. Lasix 2 cc IV BD and low protein diet. Bicarbonate dialysis was done.

On 8th day, patient was conscious and coherent, pallor, PR-88/min, BP-130/90 mm of Hg, uterine retracted well and there is no active bleeding. Patient was given Cap. Amoxycillin 500mg TID, Tab. Pantoprazole OD, Tab. Calcium 500mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Nicardia retard (nifedipine) 20 mg BD Inj. Lasix 2cc IV BD and low protein diet.

On 9th day, patient was conscious and coherent, pallor, PR-84/min, BP-110/70 mm of Hg, uterine retracted well and there is no active bleeding. Patient was given Cap. Amoxycillin 500mg TID, Tab. Ranitidine BD, Tab. Paracetamol 500mg BD, Tab. B complex/calcium/iron folic acid OD, Tab. Nicardia retard (nifedipine) 20 mg BD. Lasix 40mg OD was added.

Table 2: treatment given for seizures by Mgso₄ administration:
On 10th day, patient was conscious and coherent, pallor, PR-62/min, BP-110/60 mm of Hg, uterine retracted well and there is no active bleeding. Patient was given Cap. Amlodipine 5 mg BD and Inj. Lasix 20 mg IV BD. Biopsy was suggested. Biopsy revealed: patient was suffering with Inga nephropathy

On 16th day, patient was conscious and coherent, pallor, PR-108/min, BP-130/80 mm of Hg. Patient was given Inj. Pipzo (pipercillicin+ tazobactam) 2.25gm IV TID, Tab. Ranitidine 150 mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Caclium and Tab. Depin(nefidipine) 10 mg BD bicarbonate dialysis was done. On 17th day, patient was conscious and coherent, temperature 101°F, PR-98/min, BP-110/70 mm of Hg. Patient was given Inj.Meropenam 1gm in 100ml normal saline IV OD, Tab. Ranitidine 150mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Caclium and Tab. Amlodipine 5mg BD. Bicarbonate dialysis was performed. Biopsy was suggested.
On 23rd day, patient was conscious and coherent, fever subsided, PR-82/min, BP-130/70 mm of Hg. Patient was given, Tab. Cefixime 200mg BD, Tab. Ranitidine 150mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Calcium, Tab. Amlodipine 5mg BD and Inj. Lasix 40mg IV BD.

On 24th day, patient was conscious and coherent, PR-82/min, BP-130/80 mm of Hg. Patient was given, Tab. Cefixime 200mg BD, Tab. Ranitidine 150mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Calcium, Tab. Amlodipine 5mg BD and Inj. Lasix 40mg IV BD.

On 25th day, patient was conscious and coherent, PR-84/min, BP-150/90 mm of Hg. Patient was given, Tab. Cefixime 200mg BD, Tab. Ranitidine 150mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Calcium, Tab. Amlodipine 5mg BD and Inj. Lasix 40mg IV BD.

On 26th day, patient was conscious and coherent, PR-84/min, BP-150/90 mm of Hg. Patient was given, Tab. Cefixime 200mg BD, Tab. Ranitidine 150mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Calcium, Tab. Amlodipine 5mg BD and Inj. Lasix 40mg IV BD.

On 27th day, patient was conscious and coherent, PR-90/min, BP-150/90 mm of Hg. Patient was given, Tab. Cefixime 200mg BD, Tab. Ranitidine 150mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Calcium, Tab. Amlodipine 5mg BD and Inj. Lasix 40mg IV BD.

On 28th day, patient was conscious and coherent, PR-84/min, BP-180/100 mm of Hg. Patient was given, Tab. Cefixime 200mg BD, Tab. Ranitidine 150mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Calcium, Tab. Amlodipine 5mg BD and Inj. Lasix 40mg IV BD.

On 29th day, patient was conscious and coherent, c/o shortness of breath, PR-90/min, BP-130/80 mm of Hg. Patient was given, Tab. Cefixime 200mg BD, Tab. Ranitidine 150mg OD, Tab. Bcomplex/iron folic acid OD, Tab. Calcium, Tab. Amlodipine 5mg BD and Inj. Lasix 40mg IV BD.

**DISCHARGE MEDICATION:**

Patient general condition is normal, no fever, no vomiting, no shortness of breath, Blood pressure is 160/110 mm Hg. Patient was discharged with Tab. Depin retard 10 mg BD, Tab. Calcium+vitamin D3 OD, Tab. Amlodipine 5mg BD and Inj. Lasix 40mg BD. Dialysis was performed.
compliance and chance of re-occurrence of Inga Nephropathy.

**DISCUSSION**

In present case study, a pregnant women was initially admitted with the complaints of vomiting, edema and hypertension. So she was diagnosed with PRE- ECLAMPSIA, later she experienced seizures showing, change from pre-eclampsia to eclampsia. So patient was prescribed with Nifedipine to control hypertension, magnesium sulphate for seizures. General management for eclampsia is anti-hypertensives (except ACE I and ARB as they effect fetal development) to control hypertension. Mainly calcium channel blockers, diuretics and vasodilators were used. In present case Nifedipine was prescribed which a calcium channel blocker is. Later she was aborted and exhibited progression of CKD to ESRD and uncontrolled hypertension even after abortion. So, Biopsy was performed which reveals Inga Nephropathy. General management of Inga Nephropathy includes anti-hypertensives in order to control the blood pressure. Steroids to decrease proteinuria and reduction of ESRD. But if ESRD developed, then mainly renal transplantation is suggested. In this case, there is progression to ESRD, so patient was under dialysis and suggested for Renal Transplantation and also advised to have strict medication adherence after renal transplantation in order to avoid graft rejection and recurrence of Inga Nephropathy. But in this case study, patient was not cooperated for transplantation. So she was prescribed with Tab. Depin retard 10mg BD, Tab. Atorvastatin 10mg, Tab.Calcium+Vitamin D₃ OD, Tab. BComplex OD, Cap. Iron folic acid OD, and Tab. Lasix 40mg BD and advised to have strict medication compliance. For the better patient care Patient Information Leaflets (PIL)for Eclampsia and Chronic Kidney Disease are also given to the patients (as shown in Fig. 1 and Fig. 2) so that she will be careful in the next pregnancy condition.

**CONCLUSION**

Pre eclampsia is a disorder of wide spread vascular endothelial malfunction and vasospasm that occurs after 20 weeks' gestation and can present as late as 4-6 weeks post-partum. It is clinically defined by hypertension and proteinuria, with or without pathologic edema. If left untreated,
it may result in seizures at which point, it is known as eclampsia. The present case was found to be G3A1 with 23 weeks POG, in which first pregnancy was aborted and she was found to be hypertensive with irregular medication at the time of admission. Second pregnancy was also aborted spontaneously and biopsy revealed Inga Nephropathy. So at the time of next pregnancy, she should initially checked for the level of Inga Nephropathy condition and treatment should be started with well controlled compliance. Positive prognosis of the patient with collaborative efforts of physician, clinical pharmacist and nursing staff is attained. Eclampsia is a critical and lethal condition, so the high risk group should be promptly identified and given preventive measures to hold them from getting into further complications such as abortion and complications relating to the mother. In case of Eclampsia, patients should be admitted within the hospital and close monitoring should be provided for the better well being and to improve the quality of the patient and for the baby. The importance of medication adherence should be clearly explained to each patient especially in this type of complicated cases.

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REFERENCES