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A RETROSPECTIVE STUDY OF MAGNITUDE OF CASES OF POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME AND ITS CORRELATION WITH PREECLAMPSIA

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ABSTRACT

Introduction: PRES is a clinico-radiological entity also known as a posterior leucoencephalopathy syndrome. PRES has been associated with many condition including eclampsia, severe hypertension and auntoimmune disorders. Global incidence of PRES is unknown. Incidence of PRES amongst eclampsia patient is 17.4% and common in primigravida. Purpose of this study is to know the magnitude of PRES cases and its correlation in pre eclampsia. **Aims and Objectives:** To find out the magnitude of PRES cases in KIMS hospital Bangalore and its correlation with pre eclampsia. **Materials and Methods:** This retrospective study was performed in the department of obstetrics and gynaecology in KIMSH and data was collected from medical record section over a period of 18 months from June 2017 to October 2019. Detailed history and appropriate data was collected from the records and case file after selecting the cases based on inclusion and exclusion criteria. Each patients case record was analyzed with regard to age, parity, antenatal history, intrapartum and postpartum period, complications if any and further investigations. **Results:** In our study 360 patients were pre eclamptic out of which 21 of them had eclampsia and 8 of them were diagnosed as PRES on neuro imaging (2.2%). **Conclusion:** Hence we find that there is association between PRES and pre eclampsia and timely intervention is required to prevent further permanent complications and neurological deficits.

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INTRODUCTION

Posterior reversible encephalopathy syndrome (PRES) is a clinic-radiological entity first described by Hinchey, *et al.* (Hinchey *et al*., 1996 and Liman *et al*., 2014). Shortly after the description in 1996, two other case-series were published. PRES which is also known as reversible posterior leukoencephalopathy syndrome. It has various terminologies previously reversible posterior leukoencephalopathy syndrome, reversible posterior cerebral edema syndrome and reversible occipital parietal encephalopathy. PRES is now the widely accepted term. The global incidence of PRES is unknown (Legriel *et al*., 2011). It has been reported in patients aged 4 to 90 years, most cases occur in young to middle aged adults and death has been reported in up to 15% (Lee, 2008). It presents with rapid onset of symptoms such as: nausea, headache, altered consciousness, cephalalgia, visual disturbance, cortical blindness, blurred vision, photophobia, hemianopia, and other focal neurologic deficits such as paresis, dysesthesia, or dysphasia as well as seizure (Hobson, 2012). PRES occurs in a large array of clinical conditions, predisposing disease, and factors such as toxaemia of pregnancy, arterial hypertension, organ transplantation, autoimmune disease, conditions with renal failure as well as cytotoxic and immunosuppressive medication (Hobson, 2012). Although the underlying pathophysiological mechanisms are still debated, the main hypotheses imply both endothelial dysfunction and failure of cerebral auto-vasoregulation (Hobson, 2012). PRES is also a misnomer because the image changes and clinical features may not be limited to the posterior cerebral hemispheres (Achar, 2011). Also, the reversibility of PRES may be clinically or radiologically incomplete; the condition may be complicated by ischemic or haemorrhagic stroke, and may lead to a chronic seizure disorder or death (Pratap, 2008). Image diagnostics such as CT and MRI of CNS performed on patients with pre-eclampsia and eclampsia, have revealed PRES in several cases. MRI, is the golden standard and CT scan only revealed 50% of the

lesions. White matter lesions in the occipital lobes, posterior parietal lobes and posterior temporal lobes are classic findings. Lesions may be seen in the frontal lobes, cerebellum, and pons, but seem to be minor and only visible in addition to injuries in the other brain structures mentioned above (Nielsen, 2015). This syndrome is oedema without infusion, so early diagnosis resolves the cause and prevents permanent damage and death.

Aims and Objectives

- To find out the magnitude of PRES cases
- To correlate PRES cases with pre eclampsia.

MATERIALS AND METHODS

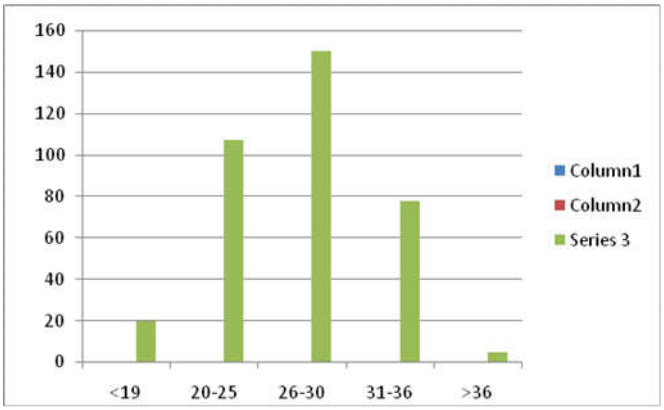
This retrospective study was performed in the department of obstetrics and gynaecology in KIMSH and data was collected from medical record section over a period of 18 months from June 2017 to October 2019. Detailed history and appropriate data was collected from the records and case file after selecting the cases based on inclusion and exclusion criteria. Each patients case record was analyzed with regard to age, parity, antenatal history, intrapartum and postpartum period, complications if any and further investigations.

OBSERVATIONS AND RESULTS

This retrospective study was performed in the department of obstetrics and gynaecology in KIMSH and data was collected from medical record section over a period of 18 months from June 2017 to October 2019.

Table 1. Age Distribution

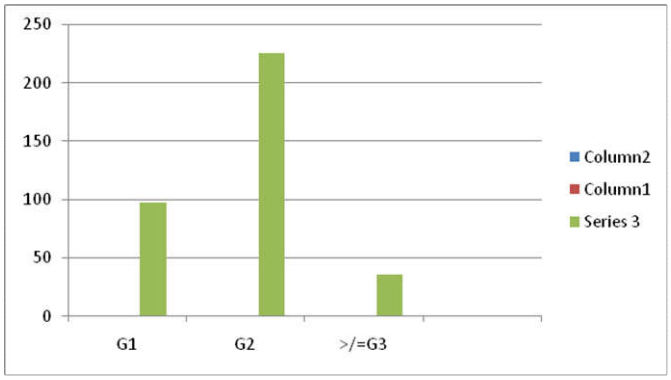
Age (yrs)	Frequency	Percentages
<19	20	5.55
20-25	107	29.72
26-30	150	41.6
31-36	78	21.6
>36	5	1.3
Total	360	100



Graph 1. Most of the patients belonged to the age group of 26-30yrs, mean age being 27.8yrs

Table 2. Distribution of Gravida

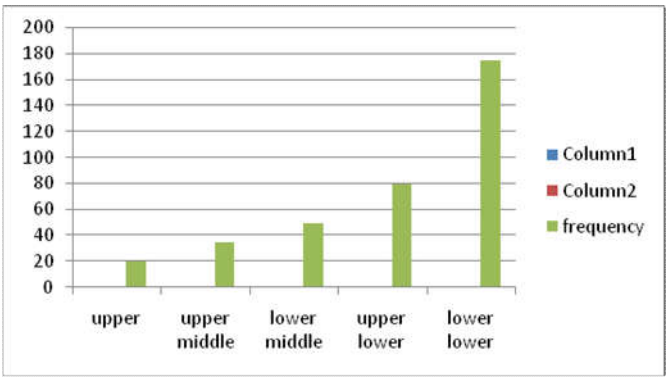
Gravida	Frequency	Percentage
Primi G1	98	27.3
G2	226	62.7
>/=G3	36	1
Total	360	100



Graph 2. 62.7% of patients were gravida 2 in our study and27.3% of them were primiravida

Table 3. Distribution of socio economic status

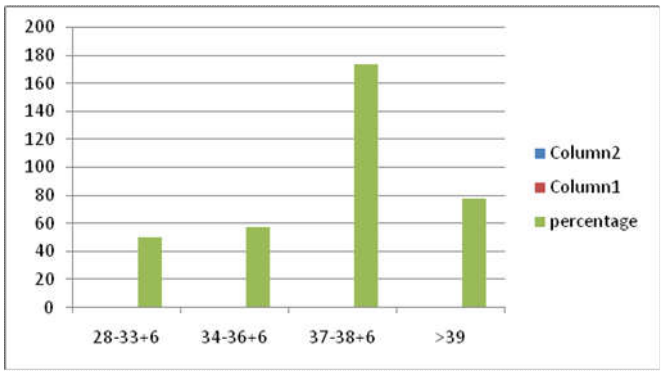
Socio economic status	Frequency	Percentage
Upper	20	5.55
Upper middle	35	9.72
Lower middle	50	13.88
Upper lower	80	22.22
Lower lower	175	48.61
Total	360	100



Graph 3. Around 61% of women belonged to lower socio economic status and 5.5% of them belonged to upper class

Table 4. Distribution of gestational age

Gestational age (weeks)	Frequency	Percentrage
28-33+6	50	13.88
34-36+6	58	16.12
37-38+6	174	48.34
>39	78	21.66
	360	100

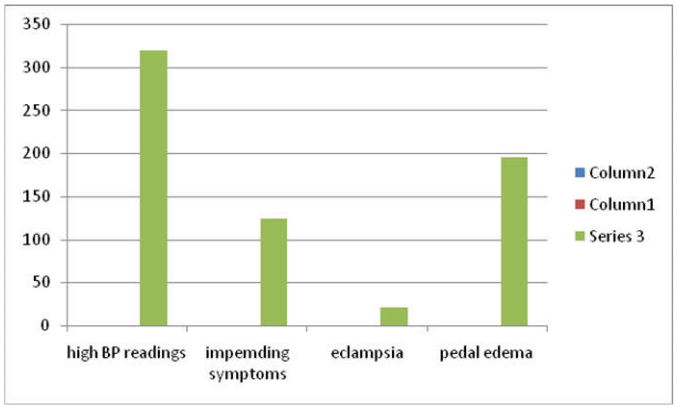


Graph 4. In our study, around 70% of women were term that is more than 37weeks, 13.9% were early preterm (28-33+6weeks)

Table 5. Various presenting symptoms

Presenting symptoms	Frequency	Percentage
High BP readings	320	88.9
Impending symptoms	124	34.44
Eclampsia	21	5.8
Pedal edema	196	54.4
	360	100

*multiple responses



Graph 5. 88.9% of the patients presented with high BP readings, 34.4% with impending symtoms and 5.8% with eclampsia. Many patients presented with two or more symptoms

Table 6. Investigations done for the patients

Uric acid	Frequency	Percentage
<3.5	68	18.8
3.5-5.5	80	22.2
>5.5	212	59
	360	100

Table 6a. Uric acid values

LDH	Frequency	Percentage
<250	100	27.78
>250	260	72.22
	360	100

Table 6b. LDH value

Platelets (in lakh)	Frequency	Percentage
>1.5	120	33.33
1-1.5	165	45.83
0.5-1	55	15.27
<0.5	20	5.55
	360	100

Table 6c. platelet count

INR	Frequency	percentage
<0.9	182	50.5
0.9-1.2	138	38.4
>1.2	40	11.1
	360	100

Table 6d. Coagulation profile

Urine routine	Frequency	Percentage
Albumin nil	83	23.05
1+	50	13.89
2+	210	58.33
3+	12	3.33
4+	5	1.39
	360	100

Table 6e. Urine albumin

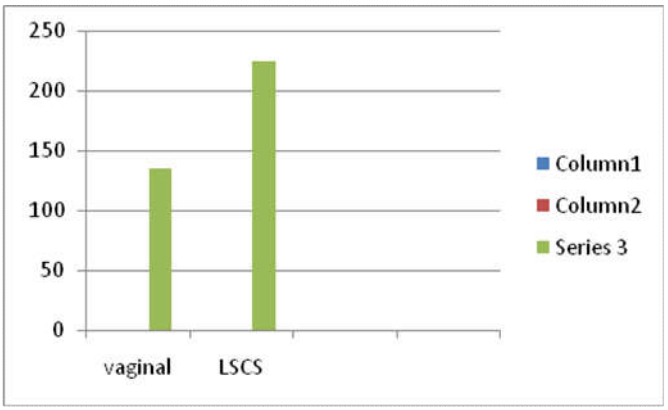
SGOT/PT	Frequency	Percentage
<35	196	54.44
>35	164	45.56
	360	100

Table 6f. SGOT/PT values

SGOT/PT	Frequency	Percentage
<35	196	54.44
>35	164	45.56
	360	100

Table 7. Mode of delivery

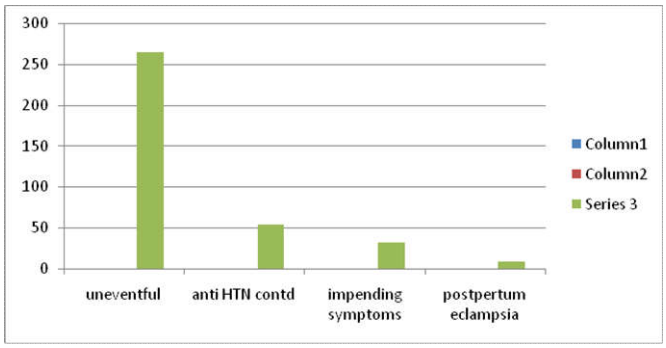
Mode of delivery	Frequency	Percentage
Vaginal	135	37.5
LSCS	225	62.5
	360	100



Graph 7. There were 62.5% of women who underwent LSCS and the rest of them were delivered vaginally

Table 8. Events in the postpartum period

Postpartum period	Frequency	Percentage
Uneventful	266	73.89
Anti HTN contd	54	15.01
Impending symptoms	32	8.88
Postpartum eclampsia	8	2.22
	360	100

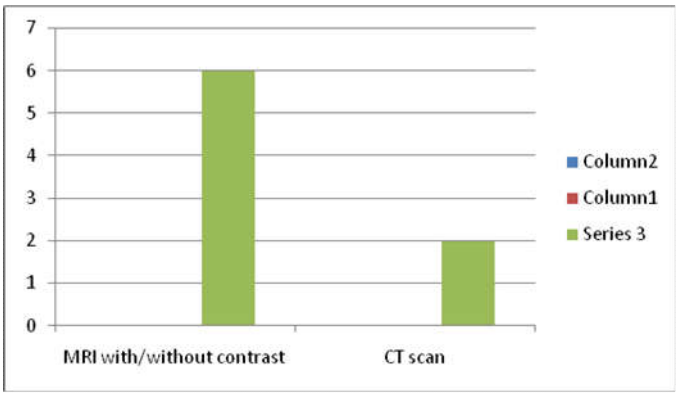


Graph 8. 73.8% of women had an uneventful postpartum period, 15% had antihypertensives continued till 2 weeks and 2.2% had postpartum eclampsia

Table 9. Imaging done for patients with potspartum eclampsia

Imaging	Frequency	Percentage
MRI with / without contrast	6	80
CT scan	2	20
	8	100

Neuroimaging was done for these patients with eclampsia- 6 of them had MRI done and 2 of them with CT scan. Both these imaging studies showed PRES in the above 8 patients. Hence 2.2% of pre eclampsia patients had PRES features.

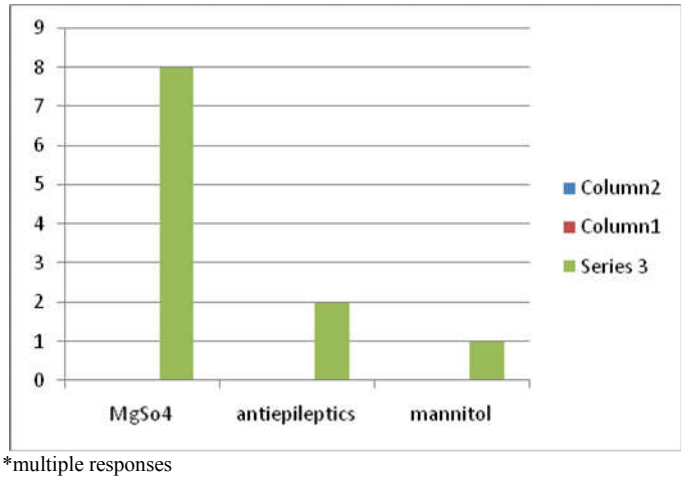


Graph 9

MRI showed diffuseedema of the white matter, which selectively involves the parietooccipital regions of the brain; edema usually shows is oorhypo intensity in DWI.

Table 10. Further mode of treatment for postpartum seizures

Mode of treatment	Frequency	Percentage
Magnesium sulphate	8	100
Anti epileptics	2	25
mannitol	1	12.5



*multiple responses

Graph 10.

MgSO4 was used for all the patients with post partumeclampsia with loading dose and continued with low dose. Two patients had further episodes of seizures for which other antiepileptics were used and mannitol was used for one patient.

DISCUSSION

This retrospective study was conducted in KIMS Bangalore over a period of 18 months and data analysed to find out the magnitude of PRES cases and correlate with cases of preeclampsia. It was found that majority of women were in the age group of26-30yrs with mean age of 27.8yrs and 62.7% of patients were gravida 2 in our study and27.3% of them were primiravida. When compared to other studies also there were patients within the age group of 20-25yrs and who were primigravida. Around 61% of women belonged to lower socio economic status and 5.5% of them belonged to upper class. In our study, around 70% of women were term that is more than 37weeks, 13.9% were early preterm(28-33+6weeks). With respect to presenting symptoms 88.9% of the patients presented with high BP readings, 34.4% with impending symtoms either head ache, blurring of vision or epigastric pain and 5.8% with eclampsia. Many patients presented with two or more symptoms. In the total no. of patients with pre eclampsia, on investigations there were 59% of them with uric acid values >5.5. 72%of them had LDH > 250. Around 49% of patients had platelet value in between 1-1.5lakh and 5.5% had less than 50 thousand. Urine albumin was 2+ in 58% of women. There were 62.5% of women who underwent LSCS and the rest of them were delivered vaginally either spontaneous or induced. 73.8% of women had an uneventful postpartum period, 15% had antihypertensives continued till 2 weeks and 2.2% had postpartum eclampsia. In those patients with postpartum eclampsia neuroimaging was done - 6 of them had MRI done and 2 of them with CT scan. Both these imaging studies showed PRES in the above 8 patients that is around 2.2% of our patients with preeclampsia which shows that there is an association between pre eclampsia and PRES.

MgSO4 was used for all the patients with post partumeclampsia with loading dose and continued with low dose. Two patients had further episodes of seizures for which other antiepileptics were used and mannitol was used for one patient. Hence the results from our study show that patients with preeclampsia can present in varying manners, thorough screening and investigations are required to tag a patient as preeclampsia and in the postpartum period there have been patients with eclampsia which is common. Prompt evaluation of such patients is a must to rule out this rare condition PRES since it is a reversible condition.

PRES syndrome can manifest in patients who are normotensive as well but more commonly seen in hypertensives and in other conditions like toxaemia of pregnancy, organ transplantation, autoimmune disease, conditions with renal failure as well as cytotoxic and immunosuppressive medication. Although the underlying pathophysiological mechanisms are still debated, the main hypotheses imply both endothelial dysfunction and failure of cerebral auto-vasoregulation. PRES is characterized by transient neurologic signs including headache, visual changes, seizures, and altered sensorium. Cortical blindness is considered a typical and characteristicsymptom of this syndrome .PRES is reversiblein a few days but if appropriate management is delayed there is high risk of permanent neurologic damage secondary to cerebral infarction or hemorrhage and transtentorial herniation resulting in death. Subjective cognitive problems, development of chronicepilepsy, and progresstoirreversible (partial) blindnesscanbelong-time consequences after years from acute episode. Early and late complication such as pulmonary edema, dissection of extracranial internal left carotid artery, cerebral herniation, short term memoryloss, subarachnoid hemorrhage, permanentmilddysmetria, visual impairment, and death have been described. Early recognizing of symptoms is fundamental for a timely diagnosis. As reported in literature cerebral MRI is the gold standard diagnostic tool; neuroimaging performed shows diffuseedema of the white matter, which selectively involves the parietooccipital regions

of the brain; edemausually shows iso or hypointensity in DWI. Leeetal. Reporteda study with 136 cases of PRES including patient unrelated to pregnancy. MRI performed in these patients showed vasogenicedemalocalized in the occipital and parietallobes (98%),but also in frontal lobe (68%), temporal lobe (60%), cerebellum (32%), and basal ganglia (14%). The initial evaluation of patients with PRES should focus on a rapid correction of blood pressure, hydration using crystalloid fluids, and maintenance of adequate oxygenation. Pandeetal. stated that PRES due to eclampsia showed a better prognosis than PRES caused by other risk factors. Limanetal. compared 24 patients with preeclampsia-eclampsia associated PRES and 72 patients with PRES of other predisposing causes and in the first group showed frequent complete resolution of edema and less frequent residual structural lesions. Demireletal. Suggested that timely supplementation of thiopental infusion to antihypertensive and magnesium sulfate treatment can improve the clinical status faster and more efficiently in patients with PRES to avoid persistent damage. Nowadays the hypothesis of endothelial dysfunction in the pathophysiology of PRES is also proposed. For this reason monitoring LDH serum level as marker of endothelial dysfunction could be useful. It is mandatory to remember that there are many severe obstetric complications that could be caused by endothelial dysfunction as preeclampsia, and so in these patients an isolated monitoring of LDH is not recommended, but a full screening for serum marker of preeclampsia.

Conclusion

The occurrence of posterior reversible encephalopathy syndrome (PRES) in patients with eclampsia is a rare condition. PRES is a reversible syndrome seen in patients with pre eclampsia and eclampsia. Hence early and prompt diagnosis with neuroimaging study will help in improvement of the outcome. In patient with PRES, a timely intervension with anti hypertensives, anti epileptics, anti cerebraledema measures as well as management of the other symptoms can reverse the condition truly.

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