

ORIGINAL RESEARCH

Neurological disorders during Pregnancy and puerperium: A focus on obstetric outcome

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Abstract

Introduction: A wide variety of neurological disorders can be encountered during pregnancy and puerperium. These disorders can be unrelated to the pregnancy like Tuberculous meningitis or can be related and more prevalent during pregnancy like eclampsia and cortical venous thrombosis. AIM: To study the clinical profile of patients presenting with neurological symptoms during pregnancy and puerperium and their outcome.

Materials and Methods: This study was undertaken in Government Thiruvavur Medical College between Jan 2022 to Dec 2022.

Inclusion criteria: All antenatal and postnatal cases.

Exclusion criteria: All Known Case of Seizure Disorder.

Results: There were 36 women included in the study. In patients with AP eclampsia seizures occur in second and third trimester and were well controlled in the majority. No fetal congenital malformations were seen. Tuberculous meningitis and Tuberculous Hydrocephalus were the CNS infections encountered and pregnancy outcome was good. Among the 2 patients with SAH we had 1 maternal Death due to Berry aneurysm rupture.

Conclusion: The incidence of neurological disorders in pregnancy is increasing now a days. The commonest neurological manifestations are due to hypertensive disorders of pregnancy. Early intervention has significantly reduced the morbidity and mortality to greater extent.

Keywords: Pregnancy, puerperium, eclampsia, neurological disorders

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Introduction

A wide variety of neurological disorders can be occurred during pregnancy and puerperium. Some disorders may be related or unrelated to pregnancy like Tuberculous meningitis. It may be prevalent during pregnancy, but still cause significant morbidity and mortality like eclampsia and cortical venous thrombosis. The diagnosis of neurological disorders during pregnancy is a challenging task, as the symptomatology may vary due to hormonal changes and exaggerated physiological response during pregnancy. So the treatment of these disorders is greater challenging due to risk to the fetus. The evaluation and management of neurological disorders require step wise approach involving multidisciplinary

team. Many of the neurological disorders can lead to devastating complications if not recognized early.

Aim and Objectives

The present study was undertaken with the objective of identifying rare neurological manifestations during pregnancy and its outcome in a tertiary Care hospital.

Review of Literature

The prevalence of primary neurological disorders in the present study was less which is similar to study by Gupta *et al.* MRI was diagnostic investigation in all cases of Primary neurological disorders while diagnosis of secondary neurological disorder was made by exclusion of any focal pathology by radiological imaging. This is consistent with the study

done by Dr. Subhashree chandrasekar *et al.* who used MRI in antenatal and CT/MRI in postnatal period.

Cortical venous thrombosis presented in 80% cases in this study which is consistent with the study by Jeng JS, Tang SC in which 73% cases of CVT occurred in the Puerperium. In a study Liang *et al.* maternal mortality rate due to cerebrovascular accidents was 17.8%, whereas in our study it is 2%.

Material and Methods

This study was conducted in Government Thiruvavur Medical College during a period of 1 year from Jan 2022 to Dec 2022. All antenatal, postpartum patients presenting with neurological symptoms were included in the study. Patients with pre-existing neurological disorders like epilepsy have been excluded from the study. For all patients detailed history, examination including the obstetric examination, basic blood investigation, ultrasonography were done. Radiological imaging was done for all cases.

Results (Including Observations)

A total of 36 obstetrics cases with neurological manifestation have been managed among those 5 have varied presentation which was tabulated. Among 36 cases presented to our hospital with neurological manifestations, 35 cases have recovered well with favourable neonatal outcome. only one case succumbed to maternal death. 12 cases delivered by Labour Natural and 24 cases delivered by LSCS. Patients with young Stroke and CVT recovered with minimal neurological deficit.

Discussion

A wide variety of neurological disorders can occur in pregnancy and puerperium. Epilepsy, CNS tumors, eclampsia, stroke, demyelinating disease of central and peripheral nervous system are primary neurological disease during pregnancy. Some neurological diseases are incidental during pregnancy like Tuberculous meningitis. Some patients present with secondary neurological disorders like metabolic encephalopathy, hypoglycemia, hepatic failure, azotemia, hypercalcemia. Hypertensive disorders in pregnancy accounting for 12% of maternal mortality worldwide. Prompt administration of magnesium sulphate will prevent eclampsia and its complications. Pregnancy is a hypercoagulable state with increased production of prothrombotic factors and fibrinogen levels and relative deficiency of fibrinolytic activity predisposes to vascular thrombotic events like cerebral venous thrombosis. Immunological changes that Occur during pregnancy will cause dissemination of infections like Tuberculosis, toxoplasmosis. AV malformations are diagnosed first during pregnancy otherwise they are asymptomatic. This is due to hormonal influence. If these AV malformation ruptured it will cause torrential bleed, if unruptured it cause compression of nerve roots resulting in neurological damage. Risk of intracranial hemorrhage

increase in pregnancy due to changes like increase in cardiac output, blood volume, vasodilatation and other hormone related changes. If diagnosed during pregnancy and before that a corrective neurosurgery can improve the outcome. CNS tuberculosis is a serious but treatable disorder with varied manifestation. Early diagnosis require high index of suspicion. CSF cytology and biochemical analysis along with ADA gives valuable clue to diagnosis. Wernickes encephalopathy is a reversible acute neuropsychiatric syndrome due to Thiamine deficiency. Signs are Ataxia, Nystagmus, confusion, Diplopia. MRI shows Symmetrical bilateral hyperintense lesions in Thalamus, mammillary body, tectal plate, periaqueductal area. One of the complication of Hyperemesis gravidarum is Central Pontine Myelinolysis- in this patient present with Muscle Weakness, Delayed Reflexes, Slow speech, Tremors, Ataxia. MRI shows symmetrical hyperintense lesions involving lower Pons. Young stroke incidence is 30 in & lakh population. Ischemic stroke is common in postpartum period. Timely brain imaging and intervention is important to optimize long term outcome. There are non-neurological conditions which can manifest with neurological symptoms like altered sensorium or coma due to dyselectrolytemia. Hence imaging plays a very vital role not only in making the diagnosis of a primary neurological condition, but also to exclude the central cause.

Review of literature

Dr. G. Preetha, *et al.* International Journal of Medical Sciences and Innovative Research (IJMSIR) study title Association of Beta HCG levels in Pre Eclampsia study sample size 200 participants. Out of 200 patients, 134 patients had no PIH had mean beta hcg levels of 71205, 45 patients had mild PIH with the beta hcg level of 101178 and 21 patients had severe PIH with the mean beta hcg levels of 154560. There was a significant difference between the beta hcg levels in mild and severe preeclamptic women compared to the normotensive pregnant women.

In another study, Sandhya Renukesh *et al.* J Clin Diagn Res. Neurological Disorders Complicating Pregnancy - Focus on Obstetric Outcome. This was a prospective observational study conducted over a period of 1 year (2013-2014) including 54 pregnant women with neurological manifestations. The spectrum of neurological manifestations was divided into-pregnancy specific, incidental and pre-existing neurological disorders for analysis. Perinatal morbidity due to Fetal Growth Restriction (FGR) was clearly more in eclampsia (72.7%) in comparison to epilepsy.

In our study, we found 36 Neurological disorders among pregnant puerperium women at Government Thiruvavur Medical College. Our tertiary care hospital consists of mostly rural populations from adjoining villages, taluks. It is very alarming.

Tuberculosis meningitis affected to one participant. This motivates us for further research in this area.

Future impact of the study

The results from our study necessitated us to do deep insights of Neurological manifestations for 1 year by doing Prospective cohort study and to find out the associated factors for the neurological manifestations in pregnancy and puerperium period. This proposal will look into missed neurological manifestations in this study additionally. Biomarkers association among Neurological disorders and Non Neurological disorders may be studied to predict the Neurological disorders at the early stage of pregnancy and to avoid the further morbidity and mortality. For reduction of

eclampsia and seizure patients, regular checking of blood pressure & sugar level, counselling and yoga practices by using Physiotherapists during Antenatal periods and Postnatal period and further immediate medical management can be given with the consultation Physician and Diabetician. Perinatal morbidity due to Fetal Growth Restriction (FGR) will be added in our future study.

Given the well-described physiological immunosuppression during pregnancy and subsequent reconstitution postpartum, physicians must be aware of tuberculous meningitis and pregnancy-related immune reconstitution inflammatory syndrome, especially in countries with a high burden of tuberculosis and in women living with HIV.



Chart 1: Mode of deliveries in neurological cases

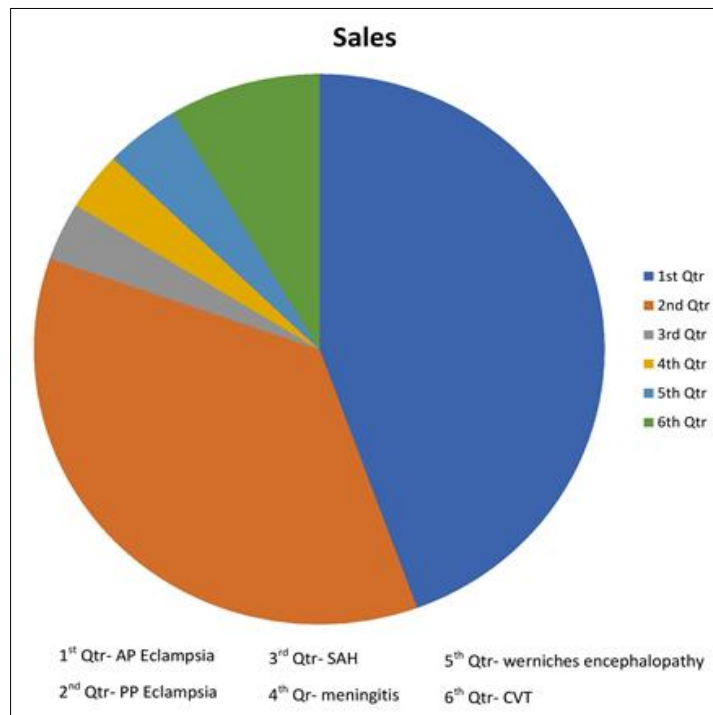


Chart 2: neurological case distribution

Table 1: Rare casev 1

S. No.	Ageand parity	Presenting complaints	Diagnosis	Imaging	Outcome
1.	25years primigravida	Fever for 2weeks not controlled with I.Vantibiotics, all feverprofile was negative. CSF analysis suggestive of Tuberculousmeningitis	Tuberculousmeningitis	MRI- Focal hyperintense signal in the Left cerebral peduncle possibility of encephalitis	Delivered by LSCS Mother recovered
2.	19yearsG2A1	Complaints of vomiting forpast 2 months increased to 10 episodes per day for past 5 days and giddinessfor 1 day	Wernicke encephalopathy	MRI- Hyperintense areas in bilateral thalamus,vermis featuressuggestive of Wernicke'sencephalopathyand central pontinemyelinolysis	Delivered byLabour natural Patient recovered

Table 1: Continue

3.	29 years primi	Headache and vomiting for 1 week and then she developed weakness of Right upper and lower limb with slurring ofspeech	Acute young stroke	MRI-Hypointense lesion in left cerebellum and left PICA infarct	Delivered by Labour natural Patient recovered
4.	25 Years Primigravida	After delivery patient had 3 episodes of seizures with Headache	Supraventricular Tachycardia withmyoclonic jerks	ECG- ventricular TachycardiaManaged with implantablecardiovertre rdefibrillator	Delivered by LSCS patient recovered
5.	40 years G2P1L1	Involuntary movements of both upper limb and lower limb,headache vomiting,blurring of vision for 2 days	SAH Berry aneurysm rupture	CT brain- SAH in basal cistern and Sylvia fissure	Post abortal patient underwent clipping of aneurysm Patient expired

Table 2:Rare case 2

Neurological complications in pregnancy	
Diagnosis	No. of cases
Ap Eclampsia	13
PP eclampsia	11
CVT	3
TB Meningitis	1
Wernicke's Encephalopathy	2
Bells palsy	1
SAH	2
TB Hydrocephalus with VP shunt	1
Young stroke	1

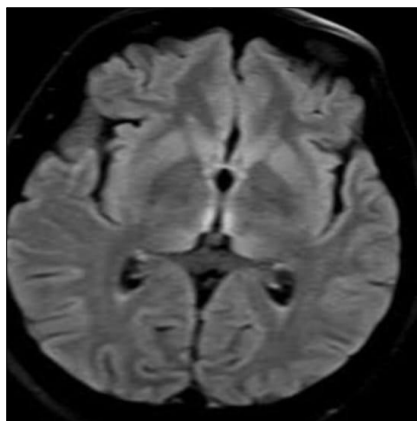


Fig 1: Image of patient with Wernicke's encephalopathy



Fig 2: image of young stroke

Summary and Conclusion

The incidence of neurological disorders in pregnancy is increasing now a days.

The commonest neurological manifestations are due to hypertensive disorders of pregnancy. Neurological manifestation during pregnancy may not always be a primary neurological disorder, it may be manifestation secondary to any systemic illness. Multi-disciplinary approach before, during and after pregnancy is recommended for a better pregnancy outcome. Obstetric management has to be individualized as in those with increased intracranial pressure, cesarean delivery may be safer.

Neuroimaging is both a diagnostic and complimentary tool in management of neurological disorders in pregnancy. The true incidence of tuberculous meningitis in pregnancy or the postpartum period is unclear but likely underappreciated. To date, nearly all published cases have occurred in HIV-negative or otherwise immunocompetent women. New onset seizures in a non-epileptic, normotensive woman can have adverse maternal and perinatal outcome. Hence early intervention is recommended which has significantly reduced the morbidity / mortality.

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