

Neurological Disorders in Pregnancy and Puerperium

Sarella LK, Rao DS,

Abstract

Objectives: To study the clinical profile of the patients presenting with neurological disorders during pregnancy and puerperium.

Methods: The study was carried out at Government General Hospital, Kakinada, Andhra Pradesh, India between June 2006 and May 2007. Patients in pregnancy, postabortal and postpartum period evaluated in Neurology out-patient and in-patient departments and referred to Neurology department, Government General Hospital, Kakinada during this time were included in this study.

Results: A total of 55 patients presented during pregnancy and puerperium with neurological disorders. Age of the patients ranged from 17 to 31 years. The total number of deliveries in this hospital during this period was 9726. Out of 55 patients Epilepsy—27[49.09%], Eclampsia—11[20%], Cerebro vascular disorders—6[10.9%], Neuropathies —4[7.27%], Extrapyramidal disorders—2[3.64%], CNS infections—Tubercular meningitis —1[1.81%], Myelopathy—1[1.81%], Toxic/ metabolic encephalopathy—1[1.81%].

Conclusions: Epilepsy was the most common neurological condition followed by Eclampsia and Cerebrovascular diseases. Health education measures for prospective mothers regarding the appropriate, adequate and regular use of anti-epileptic drugs should be taken up. Diligent care is to be taken to watch for neurological deficit in cases of Pre-eclampsia/ Eclampsia to identify special investigation team—Obstetrician, Neurologist, Physicians and Neurologist. The treating team should have the complete knowledge of the effects of rare neurological disorders during pregnancy and puerperium.

Keywords: Epilepsy, Eclampsia, Cerebrovascular disorders, Chorea gravidarum, Guillain-Barre syndrome.

knowledge of impact of illness on maternal and fetal outcomes, risks of investigations, specific treatments and safety of breast feeding. As many pregnancies are unplanned, diagnostic and therapeutic decisions should be taken to balance their beneficial and adverse effects on mother or child¹. It is ideal to consider every woman in reproductive age to be potentially pregnant from the very first visit¹.

METHODS

This study was conducted in Government General Hospital, Kakinada between June 2006 and May 2007. All patients in pregnancy, post abortal and postpartum period, evaluated with detailed history, clinical examination and basic investigations in department of Neurology were included in this study. CT, MRI nerve conduction studies and other investigations were done as required. Wherever possible a definitive diagnosis was established based upon standard diagnostic criteria.

OBSERVATIONS

A total of 55 patients presented during pregnancy and puerperium with neurological disorders. Age of

INTRODUCTION

Pregnancy is a time of major hormonal and other physiological changes that can precipitate new neurological and psychiatric symptoms¹. Though neurological disorders during pregnancy and puerperium (NDDPP) represent a small subgroup, their range is broad². NDDPP can be classified into three subgroups³. 1) Diseases which existed already before pregnancy or appear just by chance (eg: Migraine) 2) Diseases that can display a higher incidence in pregnancy (eg: Cerebrovascular disease) 3) Diseases with neurological

symptoms which occur only with pregnancy. (eg: Pre eclampsia/ Eclampsia).

Identification and management of neurological disorders during pregnancy and puerperium (NDDPP) pose a special challenge to Neurologists and Obstetricians, and they should have thorough

Table 1. Distribution of Neurological Disorders during Pregnancy and Purperium

Disease	No. of Cases	Percentage
Epilepsy	27	49.09
Eclampsia	11	20.00
Cerebrovascular disease	6	10.90
Neuropathies	4	7.27
Extra pyramidal disorders	2	3.64
Primary muscle disorders	2	3.64
CNS infections	1	1.81
Myelopathy	1	1.81
Toxic/metabolic encephalopathy	1	1.81

Rangaraya Medical College, Kakinada, Andhra Pradesh, India.

Correspondence: Dr. Lavanya Kumari Sarella

E-mail: lavanyakumarisarella@yahoo.com

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Table 2. Clinical Features of Patients with Epilepsy

Time In Relation to Pregnancy	
First trimester	4 [14.81%]
Second trimester	6 [22.22]
Third trimester	13 [48.14]
Postpartum	4 [14.81]
Type of Seizure	
Partial	1 [3.70]
Secondary generalized	10 [37.03]
Primary generalized	16 [59.25]
Status Epilepticus	4 [14.81]
Treatment Pattern	
Not on any antiepileptic drug	14 [51.85]
Monotherapy	10 [37.03]
Polytherapy	3 [11.11]

Table 3. Cerebrovascular Disorders

S. No	Clinical Disorder	Investigations	Outcome
1	26yr old primi, known HTN right hemiparesis	CT;Lt ganglionic hematoma, old lacunar infarct—Lt. PCA territory	Preterm delivery at 34 weeks. Low birth weight, residual hemiparesis
2	20yr multi 1 st trimester. Recurrent syncopal attacks. Past h/o Rt. hemiparesis	CT-old Lt. MCA infarct MRA-s/o Takayasu's arteritis	Normal labour
3	25yr multi known HTN, 2 weeks postpartum, sudden loss of consciousness, Lt. hemiparesis		Expired within few hours of admission
4	22 yr multi 3-4 weeks postpartum headache, seizures, Lt. hemiparesis	CT-frontal venous infarct empty delta sign—SSS. MR-bilateral venous infarcts MRV—SSS thrombosis	Recovered well
5	18yr primi, 2 weeks postpartum Lt. hemiparesis	CT-Rt. Fronto temporal hemorrhagic venous infarct MRV-SSS thrombosis	Recovered well
6	20yr multipara 5 th PO LSCS day headache, Lt. partial seizures	CT-s/o bilateral transverse sinus thrombosis	Improved with minimal residual Lt. hemiparesis

the patients varied from 17-31 years. The total number of deliveries in this hospital during this period was 9726. The incidence of NDDPP was 565 per 100,000 deliveries.

Epilepsy: Epilepsy constituted the most common neurological disorder comprising 27 cases [49.09%].

Eclampsia: Eclampsia was the second most common neurological condition affecting 11[20%] patients. Out of these, four patients had seizures

in third trimester and seven in postpartum period.

Two prime's presented in third trimester had focal neurological deficits. A 30 year old had right hemiparesis with CT scan showing left hemispherical infarct. Course of pregnancy was complicated by antepartum hemorrhage and intrauterine fetal death. Delivery was spontaneous without any maternal morbidity. A 19 year old, was found to be having

parenchymal and subarachnoid haemorrhage on CT imaging. She delivered a preterm still born baby. Maternal condition continued to be precarious and was discharged against medical advice.

Extrapyramidal Disorders: A 22 yr old multi with 6months of gestation and past history of chorea gravidarum, presented with severe generalized chorea. The other was a 23yr old multi in the first trimester with a past history suggestive of rheumatic fever and chorea during her childhood. Both were treated with Haloperidol with good symptomatic improvement with good maternal and fetal outcome.

Primary Muscel Diseases: A 25 yr old second gravida, a known case of Myotonia congenita, with h/o miscarriage, was followed up from 20th week gestation. She had an uneventful course with good maternal and fetal outcome. A 19 yr old primipara presented with quadriplegia on the fourth postnatal day was found to be having hypokalemia and recovered with oral potassium supplements.

Toxic Metabolic Encephalopathy: A 25yr old multi, admitted on seventh postpartum day with h/o chills, rigors and altered sensorium, improved with antibiotics and antimalarial treatment.

Infectious Diseases: A 24yr old third gravida was evaluated in third trimester for headache, vomiting and altered sensorium of 10 days duration, found to be having mild communicating hydrocephalus, and basal meningitis. She improved with antituberculous treatment, delivered at 28weeks of gestation. She had residual right sided seventh cranial nerve palsy.

DISCUSSION

The incidence of NDDPP was found to be 566 per 100,000 deliveries. This was much higher than that in previous studies from Hongkong which showed an incidence of 326 per 100,000 pregnancies². A recent study of NDDPP revealed an incidence of 584 cases per 100,000 deliveries⁴, which is similar to that seen in our study.

S. No	Presentation	Nerve Conduction Studies	Outcome
Guillain-Barre Syndrome			
1	28yr old multi with 20weeks gestation with symptoms of 2 weeks duration	Axonal motor and sensory neuropathy	Developed respiratory paralysis. Expired after 4days
2	24 yr old primi at 5 th postpartum week	Demyelinating neuropathy	Recovered
Idiopathic Facial Palsy			
1	25 yr old primi with term gestation with severe hypertension	————	Labor induced Good maternal and fetal outcome
Bilateral Carpal Tunnel Syndrome			
1	31 yr old primi in 1 st trimester with diabetes, hypertension and hypothyroidism	————	Improved

Condition	TO et al	Janaki et al	Srinivasan et al	Agarwal et al	Gupta et al	Present study
Total number	161	97	68	87	76	55
	NO [%]	NO [%]	NO [%]	NO [%]	NO [%]	NO [%]
Epilepsy	102 [63.3]	30 [30.9]	17[23.5]	5[6.7]	22[28.9]	27 [49.9]
CVD	7 [4.9]	48 [49.5]	41 [60.3]	72 [82.7]	9 [11.9]	6 [10.9]
CNS infections	————	4 [4.1]	3 [4.4]	5 [5.7]	12 [15.8]	1 [1.81]
CNS tumors	12 [7.5]	7 [7.2]	16 [23.5]	16 [23.5]	1 [1.3]	————
PE/E	19 [11.9]	NI	NI	NI	NI	11 [20]
Demyelinating diseases	4 [2.5]	1 [1.03]	3 [4.4]	1 [1.1]	1 [1.3]	————
Peripheral neuropathies	12 [7.5]	1 [1.03]	1 [1.5]	2 [2.3]	1 [1.3]	4 [7.27]
Metabolic encephalopathies	NI	NI	NI	NI	28 [36.8]	1 [1.1]
Cord affections	————	————	5 [7.4]	————	1 [1.3]	1 [1.81]
Extrapyramidal disorders	————	————	————	————	————	2 [2.64]
Primary muscle disorders	————	————	————	————	————	2 [3.64]
NI—not included						

Table 5 shows the results of previous and present studies.^{2,4,5,6,7}

Epilepsy: Epilepsy was found to be the most common neurological disorder in our study and was similar to Hongkong study. The incidence of epilepsy is lower than that in Hongkong study² and higher than that in Delhi study⁴. This disparity

from the later study can be explained by the presence of a large number of metabolic encephalopathies, which constituted majority of cases.

Trimester wise analysis showed least occurrence during third trimester and postpartum period in previous studies⁸. In a recent study there was a uniform distribution across

the trimesters and the postpartum period⁴. In our study majority of cases [48.1%] were seen in the third trimester. Primarily GTCS constituted the commonest type, constituting 59.25%, consistent with the incidence of previous study 59.38%⁹. There is a variation in the reports of incidence of Status epilepticus during pregnancy and puerperium—0.8%⁹ and 31.8%⁴ and 4 [14.81%] in our study. This can be explained by lack of awareness in the public, inadequate medical resources, inability to purchase drugs and poor compliance.

Regarding drug therapy, monotherapy with the appropriate drug and least effective dose to the epilepsy syndrome is recommended during pregnancy⁸. Polytherapy increases the incidence of major and minor fetal malformations—around 3% for one drug, 5% for two, 10% for three and greater than 20% in women taking more than three antiepileptic drugs¹⁰.

In our study, 51.85% of the woman with pregnancy and epilepsy were not receiving any treatment at the time of presentation and 37.03% were on monotherapy compared to 28.1% and 59.38% in other study⁹ which is higher and lower respectively. 11.1% were on polytherapy similar to 12.5% of other study⁹. Most of our patients receiving monotherapy were on phenytoin as it is dispensed in Government hospital.

Eclampsia: The occurrence of eclampsia is higher [63.6%] than that in Hongkong study [44-48%]¹¹. Of the two cases that had focal neurological deficits, one had ischemic stroke and the other hemorrhagic stroke. Pre eclampsia (PE)/Eclampsia (E) were found to be an etiological factor for stroke in previous studies¹², and are the major leading cause of stroke in the peripartum maternal mortality and morbidity¹³. Eclampsia was found to be associated with ischemic stroke in 24-47% of cases and cerebral hemorrhage in 14-44%¹¹. Association between history of PE and ischemic stroke remote from pregnancy necessitates close monitoring of women beyond postpartum period¹⁴. Cerebral hemorrhage is reported to be the most common cause of death in patients with eclampsia¹². These observations indicate careful

evaluation of PE/E cases to detect additional cerebral infarction or hemorrhage. Maternal outcome was good in rest of the cases with adverse fetal outcome in six cases.

Cerebrovascular Disorders: Reported incidence of stroke during pregnancy and the puerperium ranges from 5-67 per 100,000 pregnancies¹⁵, contributing to more than 12% of all maternal deaths¹². Fetal and maternal outcome may be adversely affected with premature delivery, fetal mortality, and residual neurological deficits¹⁵. 89% of pregnancy related strokes occur at the time of delivery or postpartum¹². Out of two cases with past h/o hypertension, one had stroke in the third trimester and the other two weeks postpartum. All cases of cerebral venous thrombosis were seen postpartum.

Takayasu' arteritis is a rare vasculitis, in which both ischemic and hemorrhagic strokes are reported¹⁶. Our patient presented in first trimester and had good outcome. Course of the disease appears to be unaffected by pregnancy¹⁷. Treatment with steroids with and without cytotoxic agents is recommended¹⁶. Cesarean section should be reserved for obstetric indication.

Neuropathies: Guillain-Barre syndrome affects 6-24/100,000 of population during pregnancy¹⁹. Incidence in pregnancy is not greater than expected in non-pregnant woman of child bearing age²⁰. GB syndrome is known to worsen during the postpartum period due to increase in the delayed hypersensitivity²¹. Relapses during subsequent pregnancies can occur. Pregnancy, labour and delivery proceed normally for most women²⁰. Both plasmapheresis²¹ and immunoglobulins²² were used with good maternal and fetal outcome. New born children of mothers with GBS may also be effected rarely²³.

Carpal tunnel syndrome is one of the commonest peripheral neuropathies of pregnancy²⁰. The incidence increases during pregnancy²⁴ with prevalence around 2%²⁵. Symptoms usually start in the latter half of pregnancy and improve in the postpartum period.

Recurrence can occur in subsequent pregnancies. Most improve within a few weeks postpartum²⁰. In our subject, associated diabetes and hypothyroidism might have contributed to the occurrence of symptoms in the first trimester. She improved with conservative management.

Facial Palsy: An increase in the incidence of idiopathic facial palsy during pregnancy and postpartum period was found in previous studies^{2,26}, and in third trimester and immediate postpartum in recent study^{27,28}. Prognosis is excellent and similar to that observed in non-pregnant patients²⁰. Favourable results with oral prednisolone were reported² but opinions against steroid therapy also exist²⁹. The association of idiopathic facial palsy and gestational hypertension was noted previously³⁰. Our patient presented in the third trimester and labour was induced in view of severe gestational hypertension.

Chorea Gravidarum (CG): Chorea gravidarum is a generic term for chorea of any cause starting during pregnancy. CG begins after the first trimester in half of patients, spontaneously abates in approximately one third before delivery and resolves as the pregnancy progresses and may recur in 1 in 5 women in subsequent pregnancies³¹. Maternal and fetal risks are not elevated. Elective termination is not indicated³². In our study both cases had good outcome.

Tubercular Meningitis (TBM): TBM in pregnant woman is associated with increased maternal and perinatal mortality. Favourable outcomes reported with early diagnosis and treatment⁴. Our patient presented relatively late with mild hydrocephalus but improved with medical management. She delivered a premature baby, and had residual right sided seventh cranial nerve palsy.

Hypokalemic Periodic Paralysis (HKPP): Pregnancy and delivery have been reported to exacerbate HKPP³⁴ and firm data on management is lacking³⁵.

Myotonia Congenita: A case of myotonia congenita complicated by still birth was reported³⁶. Our patient had normal delivery without any maternal and fetal adverse effects.

As the referred patients from various departments were also evaluated referral bias cannot be avoided. Many of previous studies included PE/E related strokes under CVD. We have included them under PE/E as it is a well-established clinical entity in the resources for work up and follow up in the general hospital setting. The number of cases in the study is small and a longer duration of study will reveal more neurological disorders. In view of the broad range of the neurological disorders occurring during pregnancy, a single study is unlikely to show all the entities. As such each study contributes its own component to the spectrum of neurological diseases in this context. ■

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