Paper

Neurological disorders during pregnancy and post-partum period of mothers admitted to De Soyza Hospital for Women, Colombo, Sri Lanka

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Abstract

Introduction: Identification of a neurological disorder during pregnancy is often a challenge in the context of sharing similar physiological and pathological symptomatology. Neurological disorders during pregnancy are not a common occurrence either. Studies were not previously carried out on prevalence, disease pattern or outcome of neurological disorders among pregnant women in Sri Lanka which would help to reduce the gap of missing a rare but fatal disease.

Objectives: Identify and describe neurological problems, patterns and effect on outcome during pregnancy and post-partum.

Method: A descriptive cross sectional study of term pregnant women admitted to De Soysa Hospital for delivery during the period of June to September 2013. Data gathered by interviewer administered questionnaire. Participants were followed up till end of post-partum. Clinical end points were defined by physician diagnosed cases.

Results: Out of 334 participants, 40 (12%) were identified with various neurological diagnosis irrespective of disease onset. Fourteen (4.19%) were new onset neurological problems during pregnancy or postpartum. New onset Carpal tunnel syndrome represented 1.5% which was the commonest among new onset. New onset migraine represented 0.6%. 2.4% of the participants were pre-diagnosed epileptic patients. Seizures remained unchanged among 62.5% of epileptic participants.

Conclusions: New onset neurological disorders were reported during pregnant and post- partum period by 14.9%. Primary headache accounted for the most prevailing neurological diagnosis. Migraine was the commonest cause. Carpel tunnel syndrome was the commonest new onset neurological diagnosis.

Index words: neurological disorder, pregnancy, post-partum

Introduction

Neurological symptoms during pregnancy and postpartum period are due to exacerbation of pre-existing neurological diseases (eg. multiple sclerosis or epilepsy), as an initial non-pregnancy related problem (eg. brain neoplasm) or even as a new onset neurological condition unique or related to pregnancy.[1] However there is no published data on prevalence, disease pattern or outcome of neurological disorders among pregnant women in Sri Lanka. This study aim at identifying and describing various neurological diseases, patterns, effect on the outcome of pregnancy.

Methods

A descriptive cross sectional study was conducted on pregnant mothers admitted to De Soysa Hospital for Women from June to September 2013. Hospital includes 4 units with equal turns for random admissions. All consecutive pregnant mothers admitted to randomly selected wards, whose pregnancies ceased with a delivery of a live baby or a still birth were recruited. A pre-tested interviewer administered questionnaire consists of demographic data and clinical details were administered after obtaining informed consent. Data was obtained by interviewing the patient and evaluating their clinical notes. The end points were defined by physician diagnosed cases. The recruited subjects were followed up till end of post-partum period to pick up new onset neurological problems. The evaluation was undertaken by four investigators and confirmed by the principal investigator. All investigators were medical graduates who were briefed and trained on administering the questionnaire. The statistical analyses were performed with SPSS (version 19).

Approval for this study was granted by the Ethics Committee of National Hospital of Sri Lanka. Written informed consent was obtained from all participants.

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Results

There were 334 pregnancies that were enrolled to study. Out of 334 pregnancies 40 (12%) were found with various neurological diagnoses irrespective of disease onset. Fourteen (4.19%) neurological conditions were new onset cases during pregnancy or postpartum. The summarised data are shown in table 1.

Primary headaches were the commonest neurological condition encountered irrespective of the onset, affecting 3% (10) of mothers (Table1). Migraine accounted for majority of primary headache (8 cases), other 2 suffered from tension type headache. Out of the 8 migraine cases 2 were newly diagnosed. Five of migraine subgroup did not experience change in symptoms of migraine, one was in remission during pregnancy while 2 had exacerbation of symptoms.

Eight (2.4%) with epilepsy were on regular antiepileptic medication. Seizures were exacerbated in three and managed satisfactorily by optimizing the doses of antiepileptic. None of them developed status epilepticus. All mothers delivered live babies at term, half by normal delivery, half by elective caesarean section indication being other obstetric causes. Average birth weight was 2.62kg. There were no reported admissions to premature baby care unit (PBU) or neonatal intensive care unit (NICU). Examination by neonatology team did not reveal congenital malformations in babies of epileptic mothers on AED. However congenital abnormalities were not found among the rest too.

Out of 15 reported pre-eclamptics, only one developed an eclamptic seizure at 34 weeks of gestation. She was managed with intravenous $MgSO_4$, plasma exchange and delivered a live baby of 2.4 kg by emergency caesarean section. Mother did not recover from coma, developed sepsis and died on day 6 post-partum. Despite the maternal death baby was observed in PBU and did well without any neonatal complications.

One subject presented with an ischaemic stroke at term. Initial investigations of this patient including basic haematology, biochemistry, ECG and echocardiography failed to ascertain a vascular risk factor. Five (1.5%) were

Table 1. Summary of neurological conditions among mothers

Condition	*Total cases (pre-pregnant +pregnant onset)*	*Total cases (%) (pre-pregnant +pregnant onset)*	*New onset cases (%) (pregnancy/postpartum New onset cases only)*
Epilepsy	8	2.4	0
Primary Headache	10	3	2(0.6%)
Eclampsia	1	0.3	1
Stroke	1	0.3	1
Cortical Venous thrombosis	0	0	0
Peripheral nervous system disorders (carpal tunnel syndrome)	5	1.5	5 (1.5%)
Neuro-muscular junction disorder	1	0.3	0
Motor Neurone Disease	0	0	0
Multiple Sclerosis	2	0.6	0
NMO myelitis	0	0.3	0
CNS infection	1	0.3	1
Movement Disorders	1	0.3	0
Post spinal headache	2	0.6	2
Psychiatric Disorder	6	1.8	1
CNS tumours	1	0.3	0
Vasculitis	1	0.3	1
TOTAL	40	12%	14 (4.19%)

diagnosed with Carpel Tunnel Syndrome (CTS). There was one mother with myasthenia gravis who did remained in remission while on immunosuppressive and had an uncomplicated pregnancy, delivery and post-partum period.

Two mothers with multiple sclerosis remained in remission. They were not on any disease modifying drugs and they did not relapse during their pregnancy or postpartum period and had an uncomplicated normal vaginal delivery. One mother suffered viral encephalitis during 3rd trimester, recovered completely and delivered a healthy baby. The patient with chorea and the one with meningioma went through their pregnancies uneventfully.

Of the 6 psychiatric patients, 5 had depression and the other was bipolar. Their symptoms were well controlled with medication. Four of them were pre-diagnosed cases. They remained stable on regular medication. One was diagnosed as post-partum depression.

Discussion

Neurological disorders among pregnant/post-partum women are rare. There is no documented data on the prevalence, incidence, disease pattern or impact of neurological disorders during pregnancy/postpartum in Sri Lanka. This study was carried out in immediate post-partum period. It reflects experience of a main tertiary care obstetric hospital with referrals for high risk pregnancies. Study reported 4.19% new onset neurological disorders during pregnancy and post-partum. Prevalence of new onset neurological disorders among general community in UK population is 6%.[2] Carpel tunnel syndrome was commonest of pregnancy/postpartum onset cases (1.5%) in our study. Migraine accounted for the highest number of primary headaches. Out of 8 migraine patients 2 reported the first attack of migraine during pregnancy. In literature, migraine with aura is the commonly reported type to appear first time in pregnancy, particularly in the first trimester. Pre-existing migraine often improves with pregnancy, principally menstrual migraine. Headache reappears frequently in post-partum period.[3,4]

Knight and Rhind reported that control of epilepsy during pregnancy becomes worse in 45%, unchanged in 50%, and improves in 5%.[5] Four recent studies showed that majority (60% to 83%) of pregnant epileptics do not experience a significant change. In fact change in seizure control was not seen in 62.5% of our epileptic group. Poor pre-pregnant seizure control is known to result in break-through seizures throughout pregnancy.[5,6] Mechanisms responsible for seizure clustering are pharmacokinetic alterations, folate supplementation, metabolic changes, sleep deprivation, non-compliance, stress and anxiety. Oestrogens are shown to be epileptogenic in both animals and humans while gonadotropins reduce threshold for seizures in animals. Conversely, progesterone is antiepileptic in both animals and humans.[7] Indeed a high plasma oestrogen to progesterone ratio and increased serum chorionic gonadotropins in early pregnancy account for worsening seizure control during first trimester.[7] We did not observe this first trimester preponderance. Seizures during pregnancy, risk both mother and foetus. Tonic-clonic seizures result in physical injury and abruptio placentae, hypoxia, acidosis, intracranial haemorrhage in foetus, and in-utero death.[8] Studies have revealed a higher risk of teratogenicity in epileptic women taking antiepileptics.[9] The highest incidence of congenital abnormalities are found in those exposed to multiple antiepileptic medications.[10,11] Interestingly babies of epileptic fathers are also at risk of congenital malformations.[9,11] Offspring of epileptic mothers compared to non-epileptics are approximately at three times higher risk of being epileptic, while paternal epilepsy seems not to affect the chances of the offspring being an epileptic.[12]

None of the antiepileptics is free of teratogenicity including carbamazepine (CBZ) which is usually considered to be safe.[7,13] Overall based on current information, it is generally accepted that women with epilepsy who are taking an AED as monotherapy have at least a 2-3 times increased risk over general population of having an infant with a major congenital malformations. This is equivalent to a 4-9% chance of a major congenital malformation for each pregnancy occurring to a woman taking an AED.[14,15] Well established evidence on the teratogenicity of AEDs demonstrates greatest risk from valproate. Data emerging from studies of newer AEDs, show lamotrigine to be safe.[16] Maintaining monotherapy and steady control are the fundamentals for good outcome rather than swap-ping to alternative drugs. Essentially, a positive family history of neural tube defects alarms one to withdraw the particular AED.[14,15,16]

Pre-eclampsia is a complex disorder of pregnancy-induced hypertension and proteinuria developing after 20 weeks of gestation. Eclampsia, a life-threatening complication with high maternal and perinatal mortality, is occurrence of seizure or coma in pre-eclampsia.[17] Eclamptic seizures are focal motor or generalised tonic-clonic, and often occur within the first 24 hours post-partum. The underlying causes for pre-eclampsia or eclampsia remain unknown; abnormal immunological interactions between foetal and maternal tissues were described.[18] The neuropathological changes in eclampsia include diffuse cerebral oedema, subarachnoid haemorrhage, subcortical haemorrhage, small haemorrhages and micro infarctions at several levels of the neuraxis.[17] Many eclamptic patients complain of visual symptoms and are secondary to pathophysiological changes in eye or visual cortex. Posterior reversible encephalopathy syndrome due to cerebral vasospasm is one well recognised complication.[19]

The overall perinatal mortality rate (PNMR) at Castle Street Hospital for Women, was 1.79% and 1.76% in 2001 and 2002 (Personal Communication, Director, CSHW, 2004).[20] A study conducted in De Soysa Hospital for Women and the Castle Street Hospital for Women (CSHW) in Colombo, based on 180 nulliparous women with pre-eclampsia and 180 nulliparous normotensive pregnant women from 2001 to 2003 reported a high perinatal mortality rate (PNMR) of 25% which was in agreement with previous Sri Lankan studies on pre eclamsia (PNMT 14.8%, 17%, 23.2%, 24.1%).[20] In contrast it is less than 5% in the West.[21]

Severe pre-eclampsia and eclampsia call for immediate delivery of a viable baby and maintenance of maternal health.[17] Control of arterial blood pressure, reduction of cerebral oedema, rapid control and prevention of seizures are life-saving measures. Although anticonvulsant effect is not proven, MgSO4 is the drug of choice.[22] Use of MgS04 resulted in 41% fewer maternal deaths than diazepam (RR 0.59, 95% CI 0.38-0.92, seven trials, and 3096 patients).[19] Three Cochrane reviews clearly show the benefit of MgS04 in management of eclampsia and impending eclampsia.[22] Usually the duration of treatment does not exceed 24 hours, essentially, with monitoring of respiration, urine output and tendon reflexes.[22] On going seizures should be aborted with IV diazepam or phenytoin loading.[22]

Limitation

All the pregnancies were followed up till the end of postpartum period over the phone. However, majority were not crossed examined. This was a limiting factor encountered in new onset neurological presentations during post-partum period.

Conclusion

Study reported 4.19% of new onset neurological disorders during pregnant and post-partum period. Carpel tunnel syndrome was the commonest neurological diagnosis encountered among new onset diseases. Most prevailing disorder was migraine. In majority of epileptic mothers pregnancy did not affect the seizure frequency.

Conflicts of interest

There are no conflicts of interest.

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