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ORIGINAL RESEARCH

Medicine Science International Medical Journal

Medicine Science 2018;7(4):831-3

Perinatal neurological results of patients ailing from advanced eclampsia and preeclampsia: A retrospective study

Aykan Gulleroglu[1], Melike Korkmaz Toker[2], Ayse Gul Karabay[3], Ilhan Guney Bicer[4], Mustafa Tayfun Aldemir[5]

[1]Baskent University Ankara Hospital, Department of Anesthesiology and Intensive Care Unit, Ankara, Turkey
[2]Mugla Sıtkı Kocman University, Training and Research Hospital, Department of Anesthesiology and Reanimation, Mugla, Turkey
[3]Ota-Jine Med Private Hospital, Clinic of Anesthesiology, Istanbul, Turkey
[4]Osmaniye State Hospital, Clinic of Anesthesiology and Reanimation, Osmaniye, Turkey
[5]Istanbul Saglik Bilimleri University, Kanuni Sultan Suleyman Training and Research Hospital, Clinic of Anesthesiology and Reanimation, Istanbul, Turkey

Received 30 April 2018; Accepted 12 May 2018
Available online 01.08.2018 with doi: 10.5455/medscience.2018.07.8860

Abstract

Preeclampsia/eclampsia is a contributing factor for high rates of maternal mortality worldwide. Data suggests that cerebral haemorrhage is a major cause of death among individuals suffering from preeclampsia. In this research, data was collected for over three years from pregnant women who were undergoing treatment at perinatology intensive care unit. They were admitted due to severe and uncontrolled eclampsia and preeclampsia. This research seeks to determine the frequency of patients who displayed cerebrovascular events, their clinical presentations and neuroimaging abnormalities. A retrospective evaluation of all obstetric patients who were diagnosed as pregnancy induced hypertension and followed-up between January 2011 and 2014 was performed. Retrospective computer records of age, neurologic symptom and neuroimaging findings were recorded and examined. Of the 222 participants in the study, 26 were diagnosed with severe preeclampsia while 10 patients have eclampsia. The study was performed on 36 patients whose age are ranking between 17 and 42 with a mean age of 30.06 ± 5.77. Mean systolic blood pressure was 156.89 ± 26.48 mmHg; and the average diastolic blood pressure was 98.29 ± 23.13 mm Hg. Of the 36-severe preeclampsia and eclampsia participants, 18 had begun to exhibit neurological attributes arising from eclampsia and pregnancy induced hypertension. Most common presenting symptom was generalized tonic-clonic seizures (eight, 44%). Five women had cerebral infarction and only one case had intraventricular haemorrhage. Two patients died after eclampsia crisis related intraparenchymal haemorrhage. Women ailing from advanced systolic hypertension (160 mm Hg) and severe eclampsia or preeclampsia have a higher risk of developing haemorrhagic stroke. Cerebral haemorrhage and stroke occurring in pregnancy and puerperium is a severe complication that can lead to maternal death. There should be recognition of using CT in those cases that are refractory to antihypertensive therapy can be lifesaving.

Keywords: Preeclampsia, eclampsia, intraparenchymal haemorrhage, cerebrovascular events

Introduction

Although there are a lot of improvements in health care, preeclampsia/eclampsia is an important cause of maternal mortality worldwide [1]. The rate of development of preeclampsia to the sudden form arises in %2 to %3. Furthermore, severe preeclampsia is based on a systolic blood pressure ranging at 160 mmHg or more, nephrotic range proteinuria (>3.5 gr/24 hours urine), hepatocellular injury, thrombocytopenia, diastolic blood pressure between 100 mmHg or more, pulmonary oedema and neurologic disturbances [2]. Cerebral haemorrhage is regarded as the most prevalent cause of high mortality rates among patients [3].

In this research, data was obtained for over three years from pregnant women. They had been admitted at the perinatology intensive care unit located in Istanbul Kanuni Sultan Suleyman Research and Training Hospital. They had been hospitalized due to unmanageable and advanced eclampsia and preeclampsia. This research seeks to establish the incidence of patients with cerebrovascular events at the facility, their neuroimaging irregularities and clinical attributes.

Material and Methods

The study will rely on the approval of the Istanbul Kanuni Sultan Suleyman Research and Training Hospital's Local Ethics Committee before it commences. Additionally, an analysis was carried out on the records of all obstetric patients who have been treated at Perinatology Intensive Care Unit. The data was limited to those hospitalized between January 2011 and January 2014 and had been diagnosed with eclampsia and preeclampsia while showing neurologic symptoms.

***Coresponding Author:** Melike Korkmaz Toker, Mugla Sitki Kocman University Training and Research Hospital Anesthesiology and Reanimation, Mugla, Turkey, **E-mail:** meltoker@gmail.com

Statistical Analysis

The statistical analysis aspect will rely on Statistical Software (Utah, USA), NCSS (Number Cruncher Statistical System) 2007, and PASS (Power Analysis and Sample Size) 2008.

Results

The results were obtained from 222 patients. They had been hospitalized due to pregnancy complications arising from induced hypertension. Furthermore, 10 patients had been diagnosed with eclampsia while 26 of the patients had severe preeclampsia. The study was performed on 36 patients whose age are ranking between 17 and 42 with a mean age of 30.06 ± 5.77. Mean systolic blood pressure was 156.89 ± 26.48 mmHg; and the average diastolic blood pressure was 98.29 ± 23.13 mm Hg, respectively.

Of the 36 patients with severe preeclampsia and eclampsia, 18 had began to show neurological attributes depending on the eclampsia and pregnancy induced hypertension. Additionally, the range of recorded symptomatology was provided for the 18 patients as shown in Table 1. A major symptom was widespread tonic-clonic seizures (44%). Despite this, all eight participants began to have seizures while at the intensive care, and seven were diagnosed with eclampsia. Moreover, one developed a tonic clonic seizure that arose due to epilepsy that exhibited prior to the pregnancy. Finally, two patients passed away due to eclampsia, which was linked to intraparenchymal haemorrhage.

Cranial computed tomography (CT) scans performed urgently for neurologic complication in 15 women (Table 2). Five women had cerebral infarction and only one case had intraventricular haemorrhage. CT data of one of the mortal participants is represented in Figure 1.

Table 1. The spectrum of recorded morbidity and mortality for patients

	N	%
Coma	4	23
Stupor	2	11
Eclampsia	7	39
Blurring Vision	2	11
Retinal Detachment	2	11
Seizures	8	44
Death	2	11

Table 2. The Distribution of Cranial CT Findings

CRANIAL CT FINDINGS	N	%
Encephalopathy compatible with pregnancy	2	13,33
Cerebral Infarction	5	33,33
Intraventricular haemorrhage	1	6,67
No pathology	7	46,66
Total	15	100

Figure 1. Noncontrast computed tomography (CT) of one of the mortal eclampsia patients showing basal ganglia haemorrhage open through the 4th left ventricle and moderate hydrocephalus.

Discussion

Preeclampsia is a common multisystem disorder among pregnant women [1]. It arises in 2–10% of all pregnancies [4] and is characterized by increased blood pressure and proteinuria. Preeclampsia tends to occur after 20 weeks of gestation. Eclampsia refers to the abrupt occurrence of seizures in a woman with preeclampsia. [2].

Neurological complications due to hypertensive disorders of pregnancy are the most prevalent cause of death among pregnant women [3]. Sharshar et al [5]. reported that eclampsia was linked with both nonhemorrhagic and intracerebral hemorrhage strokes. In addition, some researchers established that 25–45% of stroke cases are linked to eclampsia or preeclampsia [5,9]. According to one study, among women with a history of preeclampsia, the incidence of nonpregnancy-associated ischemic strokes in the postpartum period was 60% [10]. In strokes that occur during the puerperal period and pregnancy, previous hospital-based [11,12] and community-based [13] studies reported that the incidence of cerebral infarctions was higher than that of intracranial hemorrhages and ranged from 5–219 per 100,000 deliveries. In the present study, of 15 patients who underwent cranial tomography, five had infarction areas, mostly in the occipital region. Only one patient had a cerebral hemorrhage arising at the basal ganglia and then opening through the fourth left ventricle. The findings of the present study are in accordance with those in the literature.

The pathophysiological mechanism responsible for brain damage in preeclampsia is a form of hypertensive encephalopathy [3]. In a study of 39 patients who underwent cerebral computed tomography, Richards et al [14]. reported that acute hypertensive vascular changes appeared to be the underlying pathogenesis of central nervous system (CNS) lesions in eclampsia. Within the framework of their findings, they proposed a neurological pathophysiology of eclampsia (Figure 2).

In the current study, the average systolic blood pressure was 156.89 ± 26.48 mmHg, and the average diastolic blood pressure was 98.29 ± 23.13 mm Hg. These elevated blood pressure values explain the cerebrovascular events in our patients.

A previous study found that malignant hypertension or intracranial hemorrhages appeared to be the responsible for stroke-related

mortality linked to pregnancy [15]. Maternal deaths linked to ischemic occurrences are infrequent. In reported cases, the authors attributed them most commonly to secondary hemorrhages [16,17]. In the present study, only one of the 15 patients had an intracranial diffuse hemorrhage, and this patient died during the follow-up. The results are in accordance with those in the literature.

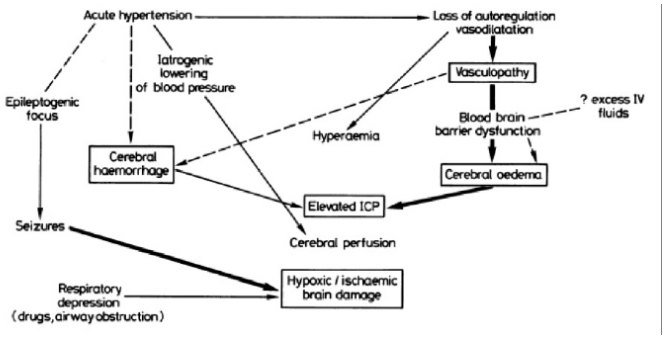

Figure 2. The neurological pathophysiology of eclampsia [14]

In the current study, infarctions, hemorrhages, and hemorrhagic intracranial lesions mostly affected the posterior circulation of the brain, and the lesions were distributed in the basal ganglia and occipital area. The forms of the hemorrhagic lesions and localization of the lesions in the present study were consistent with the literature [14,18].

There are some limitations of this study. It was a retrospective analysis, and the number of patients was very small. Furthermore, magnetic resonance imaging (MRI) could not be performed in all patients. This may have reduced the detection of less severe hemorrhages.

Pregnant women with hypertension may experience a wide range of neurological complications caused by ischemic lesions and intracranial hemorrhages. The indications for neurological-related complications include a reduced level of consciousness and blurred vision. Women with eclampsia or preeclampsia and systolic hypertension (>160 mm Hg) have an elevated risk of having a hemorrhagic stroke. To minimize the risk of this neurological occurrence, such women require urgent and specialized care, including antihypertensive therapy, in intensive care units [19].

Conclusion

Cerebral hemorrhages and strokes in pregnancy and puerperium are severe complications, which can lead to maternal death. CT should be performed in cases refractory to antihypertensive therapy to prevent mortality.

Competing interests
The authors declare that they have no competing interest.

Financial Disclosure
The financial support for this study was provided by the investigators themselves.

Ethical approval
The study will rely on the approval of the Istanbul Kanuni Sultan Suleyman Research and Training Hospital's Local Ethics Committee before it commences.

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