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CLINICAL FEATURES, CURRENT TREATMENTS AND OUTCOME OF PREGNANT WOMEN WITH PREECLAMPSAIA/ECLAMPSIA IN NORTHERN AFGHANISTAN

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ABSTRACT

In Afghanistan, preeclampsia/eclampsia is the second leading cause of maternal deaths following maternal hemorrhage. This study aimed to describe clinical features, current treatments, and outcome among preeclampsia and eclampsia patients in the north region of Afghanistan. This was a retrospective study based on medical records of four center hospitals (one regional hospital and three provincial hospitals) in the north region of Afghanistan. Subjects were 322 patients with preeclampsia/eclampsia, admitted from March 2012 to March 2013. Out of 322 cases, 72.7% were diagnosed as preeclampsia and the rest as eclampsia. Those aged 30–39 years were 41.0% among preeclampsia patients and 29 years and younger were 35.2% among eclampsia patients (p= 0.002). The first delivery was significantly higher (p=0.045) among eclampsia patients (51.1%) than among preeclampsia patients (36.8%). While none died among the preeclampsia patients, 12 out of 88 eclampsia patients died in the hospitals. The causes of the 12 deaths were pulmonary edema (6 patients), renal failure (3 patients), cerebrovascular attack (2 patients), and hemorrhage (1 patient). There were no clinical findings at admission significantly associated with the deaths within the eclampsia patient group. Although the sample size was not large enough, patients admitted to the regional/provincial hospitals at the stage of preeclampsia had a low risk of death. Access at the stage of preeclampsia and improvement in treatments for eclampsia would reduce maternal mortality in Afghanistan.

Key Words: Preeclampsia, Eclampsia, Maternal mortality, Afghanistan

INTRODUCTION

It was estimated that there were around 358,000 maternal deaths among 127 million births globally in 2008, indicating one maternal death every one and half minutes. Among them 99% were in developing countries.[1,2)] Hypertensive disorders of pregnancy are a leading cause of maternal mortality worldwide,[3-6)] accounting for one death in 1,700 to 2,100 deliveries.[1)] Maternal death rates and health care quality vary among low- and middle-income countries,[7)] depending

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particularly on the availability and quality of intensive care.[8] Since the precise roles of genetic and environment factors on the risk of preeclampsia/eclampsia have not been fully elucidated,[9] the techniques of care and treatment are absolutely a deterministic factor of the prognosis.

Pharmacotherapy for pregnant women is a special concern because of the potential risk of teratogenicity and the altered physiological state of the mother.[6] Up to 10% of congenital anomalies may be ascribed to exposure to medications, alcohol, or other exogenous factors that have adverse effects on the developing embryo or fetus.[10] Although the World Health Organization has developed drug use indicators for evaluating drug use patterns in a region or facility,[11] these are general indicators that do not refer to particular disease status of the patient.

In Afghanistan, maternal mortality ratio was 327 deaths per 100,000 live births.[2] The most common cause of maternal death was hemorrhage, followed by preeclampsia/eclampsia.[2] Since the actual clinical features of patients with preeclampsia/eclampsia provided fundamental information, this study aimed to describe the clinical features, current treatments and outcome among preeclampsia and eclampsia patients in the north part of Afghanistan.

MATERIALS AND METHODS

The study areas were four provinces in the north region of Afghanistan. They were one regional hospital in Mazar-i-sharif city, Balkh province, located in a 425 km north of Kabul, the capital of Afghanistan, and three provincial hospitals located in the provinces (Jawozjan, Faryab and Samangan) neighboring Balkh province. The population covered by the four hospitals was about 6 million.

This was a case-series study based on the medical records of patients with a diagnosis of preeclampsia/eclampsia, and were admitted to one of the four hospitals (Mazar-i-sharif Regional Hospital, Jawozjan Provincial Hospital, Faryab Provincial Hospital, and Samangan Provincial Hospital) from March 2012 to March 2013. These hospitals were governmental, which provide services without charge. Data collected from medical records were age, parity, gestational age in weeks, hospital stay in days, mode of delivery, place of residence (rural/urban), prodromal signs and symptoms (headache, convulsion, unconscious state, pedal edema, vertigo, blurred vision, and epigastric pain), previous history of hypertension, family history of hypertension, as well as medication for convulsion and hypertension during the admission and prognosis (live discharge or death).

According to the criteria of the American College of Obstetricians and Gynecologists.[9] Preeclampsia is a syndrome defined by hypertension and proteinuria, which may be associated with various other signs and symptoms such as edema, visual disturbances, headache and epigastric pain. Hypertension is defined as a systolic blood pressure level of 140 mmHg or higher or a diastolic blood pressure level of 90 mmHg or higher occurring after 20 weeks of gestation for women with previously normal blood pressure. The proteinuria is defined as a urinary excretion of 0.3 g protein or higher of protein in a 24-hour urine specimen or ≥ 1+ proteinuria on dipstick on at least two occasions (4 hours apart). The occurrence of new onset generalized seizure in preeclampsia patients, not related to other convulsive disorders was considered as eclampsia.[9] In this study, unconscious state due to eclampsia was included. This is because, due to the weak referral system to tertiary hospital and delay in timely hospital management in Afghanistan, eclampsia patients with multiple convulsion prior to admission may lose consciousness and need to be brought to the hospital by a relative in such an occurrence. Although most authorities in Afghanistan recommend hospitalization only in cases of severe preeclampsia/eclampsia, all patients with preeclampsia/eclampsia were hospitalized in the four hospitals for close monitoring

and timely drug administration. This was because the majority of pregnant women presenting in the area were illiterate, with only rudimentary medical knowledge of their own pregnancies and most of them being from a rural areas.

The data were input at Mazar-i-sharif Regional Hospital in Balkh province using Microsoft Access. Statistical Package for the Social Sciences (SPSS) version 16 was used for analysis. Categorical variables were examined using a chi-square test. P-values of less than 0.05 were considered statistically significant. This research was approved on October 2013 by the Ethical Committee of Mazar-i-sharif Regional Hospital, Ministry of Public Health of Afghanistan.

RESULTS

Out of 322 cases, 72.7% were preeclampsia patients and the remaining 27.3% were eclampsia patients (Table 1). Those aged 30–39 years made up 41.0% of the preeclampsia patients and 35.2% among 29years and younger of the eclampsia patients (p=0.002). Mothers experiencing their first delivery were significantly higher (p=0.045) of eclampsia patients (51.1%) than pre-eclampsia patients (36.8%). Most of the patients were from rural areas: 69.2% of the preeclampsia patients and 72.2% of the eclampsia patients. Pre-term gestational age was 28.2% of preeclampsia patients and 20.5% of eclampsia patients, while post-term gestational age was 2.1% and 13.6% respectively (p<0.001). History of previous hypertension was observed in 5.6% of preeclampsia patients but was not observed in those with eclampsia. The difference was significant (p=0.014). There was no significant difference in family history of hypertension between preeclampsia and eclampsia (6.4% and 4.6%, p=0.368). Before arriving at the hospital, 88.6% of eclampsia patients suffered their initial fit.

Table 2 shows the symptoms and signs at the time of admission. Headache was the most common symptom and significantly higher (p<0.001) in the preeclampsia group (86.3%) than in the eclampsia group (46.6%). Significant differences were observed in epigastric pain (32.1% and 9.1%, p<0.001), blurred vision (26.5 and 12.5% p=0.004), edema (24.8% and 10.2%, p=0.002) and vertigo (16.7% and 6.8%, p=0.014). Within the proportion of people with hypertension at the time of admission; systolic hypertension was 88.9% in preeclampsia patients and 83.0% in eclampsia patients (p=0.110), while diastolic hypertension was 90.2% in preeclampsia patients and 83.0%, in eclampsia patients (p=0.058). Although all subjects had proteinuria by definition, those with a urinary excretion of more than 0.3 g protein in a 24-hour urine specimen were significantly more common in the eclampsia group (86.4%) compared to the preeclampsia group (70.9%, p=0.003).

Table 3 displays mode of delivery, hospital stay and prognosis. The patients with normal vaginal delivery were 59.4% in the preeclampsia group and 48.2% in the eclampsia group, followed by induced delivery (27.7% and 28.9%) and cesarean section (12.9% and 22.9%, respectively). Mean duration of hospital stay was 3.41 days with a standard deviation of 1.61 days for pre-eclampsia patients, and 3.47 days with a standard deviation of 1.75 days for eclampsia patients.

Magnesium sulfate was administered to prevent and treat convulsion for the majority (59.4%) of preeclampsia patients and all the eclampsia patients (Table 4). Against hypertension, hydralazine and methyldopa were used frequently; most of the patients among preeclampsia group used methyldopa (56.8%, p<0.001), whereas patients among eclampsia group preferred to use hydralazine (69.3%, p=0.014). Among the 88 patients with eclampsia, 12 women died. The causes were pulmonary edema (6 patients), renal failure (3 patients), cerebrovascular (2 patients) and hemorrhage (1 patient).

Table 1 Characteristics of women with preeclampsia and eclampsia

Characteristics	Preeclampsia (n=234)		Eclampsia (n=88)		*p*-value
	n	(%)	n	(%)	
Age (years)					
15–20	41	(17.5)	31	(35.2)	0.002
21–29	80	(34.2)	31	(35.2)	
30–39	96	(41.0)	23	(26.1)	
40–49	17	(7.3)	3	(3.4)	
Parity					
0	86	(36.8)	45	(51.1)	0.045
1	37	(15.8)	16	(18.2)	
2–4	45	(19.2)	13	(14.8)	
≥5	66	(28.2)	14	(15.9)	
Area					
Rural	162	(69.2)	64	(72.7)	0.320
Urban	72	(30.8)	24	(27.3)	
History of hypertension					
Patient's history	13	(5.6)	0	(0.0)	0.014
Family history	15	(6.4)	4	(4.5)	0.368
Fits					
Before arriving at hospital	0	(0.0)	78	(88.6)	<0.001
After arriving at hospital	0	(0.0)	10	(11.4)	
Gestational age (in weeks)					
Preterm[a]	66	(28.2)	18	(20.5)	<0.001
Full term[b]	163	(69.7)	58	(65.9)	
Post term[c]	5	(2.1)	12	(13.6)	

a: <37 weeks, b: 37–41 weeks and 6 days, c: ≥42 weeks.

Table 2 Symptoms and signs at admission

Characteristic	Preeclampsia (n=234)		Eclampsia (n= 88)		*p*-value
	n	(%)	n	(%)	
Symptoms					
Headache	202	(86.3)	41	(46.6)	<0.001
Vertigo	39	(16.7)	6	(6.8)	0.014
Blurred vision	62	(26.5)	11	(12.5)	0.004
Epigastric pain	75	(32.1)	8	(9.1)	<0.001

Signs					
Systolic hypertension[a]	208	(88.9)	73	(83.0)	0.110
Diastolic hypertension[b]	211	(90.2)	73	(83.0)	0.058
Proteinuria[c]	166	(70.9)	76	(86.4)	0.003
Convulsion	0	(0.0)	70	(79.5)	<0.001
Unconscious	0	(0.0)	22	(25.0)	<0.001
Edema	58	(24.8)	9	(10.2)	0.002

[a] ≥140 mmHg, [b] ≥90 mmHg, and [c] > 0.3 g in 24 hours urine specimen.

Table 3 Mode of delivery and maternal outcome of preeclampsia/eclampsia

Characteristics	Preeclampsia (n=234)		Eclampsia (n=88)		*p*-value
	n	(%)	n	(%)	
Mode of delivery (n=307)[a]					
NVD[b]	133	(59.4)	40	(48.2)	0.074
C/S[c]	29	(12.9)	19	(22.9)	
Induced[d]	62	(27.7)	24	(28.9)	
Hospital stay(days)					
1 day	21	(9.0)	9	(10.2)	0.915
2 days	63	(26.9)	20	(22.7)	
3 days	50	(21.4)	22	(25.0)	
4 days	45	(19.2)	16	(18.2)	
≥ 5 days	55	(23.5)	21	(23.9)	
Mean (SD[e])	3.40	(1.61)	3.47	(1.75)	
Maternal outcome					
Live	234	(100.0)	76	(86.4)	<0.001
Death	0	(0.0)	12	(13.6)	

[a] Ten patients from preeclampsia group and five patients from eclampsia group were discharged from hospital without delivery after improvement of condition through medication. [b] normal vaginal delivery, [c] cesarean section, [d] vaginal delivery by induction (misoprostol), and [e] standard deviation

Table 4 Treatment modalities of patients with preeclampsia/eclampsia

Characteristic	Preeclampsia (n=234)		Eclampsia (n=88)		*p*-value
	n	(%)	n	(%)	
Anticonvulsant					
Magnesium sulfate	139	(59.4)	88	(100.0)	<0.001
Diazepam	12	(5.1)	8	(9.1)	0.146
Antihypertensive					
Hydralazine	129	(55.1)	61	(69.3)	0.014
Methyldopa	133	(56.8)	18	(20.5)	<0.001
Enalapril	8	(3.4)	1	(1.1)	0.244
Antibiotics					
Ceftriaxone	22	(9.4)	22	(25.0)	<0.001
Ampicillin	153	(65.4)	63	(71.6)	0.178
Metronidazole	38	(16.2)	18	(20.5)	0.232
Miscellaneous					
Hydrocortisone	1	(0.4)	1	(1.1)	0.473
Dexamethasone	12	(5.1)	11	(12.5)	0.024
Misoprostol	33	(14.1)	15	(17.0)	0.309

DISCUSSION

To the best knowledge of the author, there were few studies in Afghanistan to describe clinical features, current treatments and outcome among preeclampsia and eclampsia patients. The present study showed that the majority of preeclampsia were at the age of 30–39 years and the majority of eclampsia patients were 29 years old or younger, which was consistent with the findings of other studies.[4,6,12,13] This study found that eclampsia/preeclampsia was common in the first delivery (51.1% and 36.8% of the subjects, respectively). Similar findings were also reported in previous studies.[4,14]

Most of the patients were from rural areas (69.2% of preeclampsia patients and 72.2% of eclampsia patients). However, there might be more patients with preeclampsia/eclampsia in rural areas, because visits to the hospitals from rural areas were difficult due to unpredictable security, fragmented transportation, lack of supervision of health centers and inadequate of logistics,[15] and shortage of qualified health professionals in terms of numbers, gender, quality and distribution at all levels of the health services, especially for female medical doctor and midwives in rural than in urban society.

There was no significant difference in blood pressure between preeclampsia and eclampsia patients at time of admission. This finding was similar to that of other studies.[4,8,12] This indicates that severity of hypertension is not a predicting factor for convulsion. However, some researchers believe that the progression from preeclampsia to ecalmpsia is due to hypertensive encephalopathy,[16] and that a systolic blood pressure of less than 140–150 mmHg and a diastolic blood pressure of less than 80–90 mmHg is recommended to minimize the risk of hemorrhagic stroke.[17] In this study, headache, vertigo, blurred vision, epigastric pain, and edema were sig-

nificantly comment among preeclampsia patients. However, 88.6% of patients had their first fit before arrival at the hospital or a history of a fit obtained from her relatives who accompanied the patient to the hospital. The fact that 80% of births in Afghanistan take place at home[18] may need to be taken in consideration regarding initial fits before arriving at the hospital. Several studies in the other countries reported similar ranges (72.0% to 94.0%).[4,8,19,20] In addition, it should be noted that the majority of maternal mortality results from out-of-hospital seizures.[21] The delay of treatment in hospital seems an important risk factor of maternal mortality among preeclampsia/eclampsia patients.[13]

In the present study, a relatively low rate of cesarean section delivery was observed among preeclampsia and eclampsia patients. Most of previous studies in the region found a higher rate than the present study. For example, 71.0% for preeclampsia and 47.0% for eclampsia in India,[6] 50.0% and 52.4% in Pakistan,[22] and 66.4% and 57.5% in Iran,[8] respectively. Possible reasons for the lower cesarean section rate in this study might be higher tolerance of delivery pain due to 1) an image of cesarean section as a major operation, 2) a cause of hardship among pregnant women, and 3) social beliefs that cesarean sections lead to a risk of infertility in the long run. A study showed similar concerns with the link between cesarean section and social beliefs; there may be voluntary component to the causal relation between cesarean and infertility but the mechanism could be social/psychological rather than pathological.[23] Mean duration of hospital stay was 3.41 days in preeclampsia patients, and 3.47 days in eclampsia patients, being consistent with another previous study in Nigeria (4 days in preeclampsia and eclampsia).[24]

In this study it was observed that magnesium sulfate was administrated for prevention and treatment of convulsion for the majority of preeclampsia patients and all the eclampsia patients. Magnesium sulfate is recognized internationally as the first line treatment for preeclampsia/eclampsia, and recommended by various international organizations as an essential supplement, necessary for achievement of Millennium Development Goals 5.[25] It is widely available in Afghanistan hospitals because it is recommended by the national guidelines for the management of preeclampsia/eclampsia, and is included in the Ministry of Public Health's essential drug list for the prevention and treatment of convulsion among preeclampsia/eclampsia patients. However a study from Nigeria has shown that diazepam was still used as the first choice for convulsion and it was found to be effective because it is readily available, cheap, and efficient for the control of convulsion.[19] Several complications have been reported due to over sedation due to diazepam like respiratory depression of the mother, hypotonia and apnea at birth.[19] Perinatal mortality rate, a major marker to assess the quality of health care delivery, refers to the number of perinatal deaths (fetal and infant deaths from 28 weeks of gestation to the neonatal period, including stillbirths) per 1,000 live births. Precise perinatal death statistics for Afghanistan are not available. However, the neonatal mortality rate in Afghanistan was 36 per 1,000 live birth on 2012.[26] This study found that the maternal mortality rate was 13.6% in the eclampsia group. The mortality rate was more than twice as high as in an Indian study (5.3%),[6] but lower than Kerman (18.2%)[8]. One reason for the risk of maternal mortality may be low rate of cesarean. For instance, if a cesarean section was indicated, but could not be performed in appropriate conditions, a patient's condition could become critical, leading to a higher mortality rate. A shortage of human resources and surgical capacity in remote facilities can cause poor decision-making by health service providers.

There were several limitations in this study. First, it was a retrospective review based on the medical records of the inpatients, indicating that the findings may not be generalized to the whole population in the region, where the institutional delivery rates were low and many women died without visiting to any medical facility. Second, the sample size was relatively small so that statistical power might not be enough. Third, the data were not available for all inpatients,

so that there might be cases not recognized as preeclampsia/eclampsia. However, it is believed that the results of this study could contribute to further study to identify the risk factors for preeclampsia and eclampsia.

Afghanistan has made notable progress in the quality, coverage and utilization of hypertensive disorder of pregnancy over the past 10 years in several facilities including the present study facilities, in order to reduce the level of maternal mortality. If the high quality of maternal health services are provided at all levels of health care system closely linking referral and transportation systems, we can overcome this serious disease. Education of women to get themselves take part in antenatal care at the first stage of their pregnancy would guide them to the monitoring of blood pressure and proteinuria. Patients admitted at the stage of preeclampsia had a low risk of death: improved access and earlier intervention at the stage of preeclampsia and improvement in treatment for eclampsia would reduce maternal mortality in Afghanistan.

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CONFLICT OF INTEREST

The author has no conflict of interest.

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