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DIFFERENT TYPES OF HEADACHES AND RELATED FACTORS IN HOSPITALIZED PREGNANT WOMEN

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ABSTRACT

Headache is one of the most common complaints in pregnant women. Different conditions including vascular disorders and thrombosis can have role in headache. The objective of this study was to assess the frequency of different types of headaches during pregnancy among hospitalized patients. In this descriptive-analytic study, 616 pregnant women who presented with headache from 2009 to 2015 and were admitted to our university hospital were studied. A checklist was designed which included demographic data, the frequency of different types of headaches, radiologic evaluation, frequency of photophobia, nausea, vomiting, fever, neck stiffness, decreased consciousness level, convulsions, blurred division, palsy, muscular stiffness, vertigo, epigastric pain, and fatigue were recorded using the medical records. The data were analyzed using the SPSS software. Mean age of the patients was 30.03 years and mean gestational age was 32.63 weeks. Mean gravity was 2.30 and mean parity was 0.09. The most frequent type of headache was related to preeclampsia seen in 430 patients (70%) and the least frequent type was hemorrhaging arteriovenous malformation (AVM) or aneurysm (each was documented in five patients (0.8%)). Due to lack of enough studies about headaches during pregnancy, the presented results can be considered as a basis for Future studies

KEYWORDS: ***Pregnancy; headache; migraine; arteriovenous malformation; thrombosis; preeclampsia***

INTRODUCTION

Headache is the most prevalent neurologic complaint in pregnancy. The prevalence of headache during pregnancy has been reported up to 35%. About 90% of headaches are of tension and migraine headaches [1]. Headaches are generally categorized into two groups, namely primary and secondary headaches. Secondary headaches are caused by disorders such as intracranial or extra cranial malformations or systemic or metabolic diseases [2]. The primary headache syndromes include migraine headache, tension headache, cluster headache, and headaches without structural lesions. Secondary headaches include headache associated with head trauma, vascular disorders, intracranial non-vascular disorders, substance abuse or withdrawal, non-neurologic infections, metabolic disorders, facial pain syndromes, neuralgia, and neural trunk pain [3]. Migraine headache is a chronic headache which is associated with symptoms such as unilateral pulsating pain, nausea, photophobia, phonophobia and pain with head motion. The incidence of this type of headache is variable. But more than 50% of patients with migraine headaches experience more than one headache attack per week. Migraine is divided into two categories: migraine without aura (70%) and migraine without aura (30%). The aura refers to focal neurologic symptoms (visual, sensory, motor, or verbal), language or dysphasic aura, and paresthesia in one side of the body. Visual symptoms are the most common symptoms and sensory symptoms are less common [3]. Migraine without aura has at least five criteria of the following: headaches which have at least two criteria of leave 2 criteria of unilateral, pulsating, moderate to severe headache and increased headache with head motion, headaches associated with nausea, photophobia, or phonophobia and no evidence of a physical disease [4, 5]. Another type of headaches is headache with aura. This type of migraine should have at least 2 criteria of the following: visual symptoms such as positive visual phenomena (scotoma), negative phenomena (decreased vision), verbal symptoms, positive sensory symptoms (tingling) and negative sensory symptoms (paresthesia), headaches that

occur in less than 60 minutes after aura, and no evidence for a systemic disease [5]. Headache is one of the symptoms of severe preeclampsia and occurs in 75% of patients and can be bitemporal, frontal, occipital, or widespread. The headache can be associated with findings such as blurred vision, diplopia, scotoma, etc. The criteria of this type of headache include bilateral, pulsating headaches which increase with physical activity. These headaches usually occur when blood pressure rises [5]. In most cases headache is among the most common signs of cavernous sinus thrombosis (CST). This is a progressive and severe pain associated with increased intracranial pressure. In the United States, of 10 pregnant mothers with CST, one dies. The symptoms of CST include headache in a patient without previous history of headache, a progressive and severe headache (thunderclap headache) which is aggravated by talking, laughing, and activity. Other symptoms include tinnitus, neck stiffness, and increased CSF protein content and pressure [6]. Another type of headache is headache as a result of hemorrhage of arteriovenous malformations (AVM). AVM rupture can occur in 87% of cases during pregnancy and is lethal in 25-30% of cases. AVMs are abnormal vascular connections which allow the arterial blood to enter the venous system without passing through the capillaries. AVMs are most commonly found in the territory of middle cerebral artery (MCA). The diagnosis of this type of headache is usually made by history which shows new and acute headaches and AVMs found on brain imaging [2, 5, 7]. Aneurysmal rupture can occur at any time of pregnancy but most often occurs in the third trimester or shortly after delivery. Headache has been reported in 18% of patients without ruptured aneurysm and in 50% of cases a severe headache exists before aneurysmal hemorrhage. Aneurysms are the result of weakness in the development of vascular walls, especially at the place of bifurcation. This type of headache is new, acute, and severe and brain imaging shows aneurysmal rupture [3, 5]. Regarding the importance and high risk of complications such as congenital malformations, low birth weight, and higher great of cesarean section and no comprehensive information about headaches in pregnancy this study was done on pregnant women to evaluate the frequency of different types of headaches.

MATERIALS AND METHODS

This study was a descriptive-analytic study on 616 pregnant mothers admitted to our university hospital because of headache from 2009 to 2015. The exclusion criteria were mothers who were admitted with symptoms other than headache. The sampling method was census. For 82 mothers that diagnostic criteria of different types of headaches were found, radiologic evaluation was requested. Twenty mothers did not consent for radiologic examination. A checklist was designed by the research team and the required data were extracted from the medical records. The data included different types of headaches and related factors including photophobia, nausea, vomiting, fever, neck stiffness, decreased consciousness level, convulsions, blurred division, palsy, muscular stiffness, vertigo, epigastric pain, and fatigue. The data were entered into the SPSS software for analyses.

RESULTS

A total number of 616 pregnant women were studied. Mean age of the sample was 30.03 years (range, 15 to 48 years).Mean gestational age was 32.63 weeks (range, 10 to 40 weeks). Mean gravidity number was 2.30 (range, 1 to 12). Mean parity number was 0.09 (0 to 9). Mean hemoglobin value was 12.43 g/L (range, 8.3 to 16.1). Mean serum sodium value was 139.2 mg/dL (range, 132 to 148). Mean potassium value was 4.33 mg/dL (range, 3.2 to 5.8). Mean calcium level was 7.8 mg/dL (range, 6.1 to 9.9). Table 1 presents the frequency of different types of headaches. For 62 patients who had secondary or resistant headaches, radiologic evaluation was done which included MRI (56 cases, 68.1%), MRV (magnetic resonance venography) for two subjects (2.4%), and CT scan for four patients (5%). On MRI examination, 34 patients had normal findings, one patient had hemorrhaging aneurysm, three had evidence of hemorrhaging AVM, three had thrombosis, 10 had cerebral edema, and five patients were diagnosed with pituitary hypoplasia. Patients who underwent CT scan had unremarkable findings. For two patients who underwent MRV, thrombosis was confirmed. Gestational age had significant correlation with headache occurrence ($P< 0.05$). Table 2 presents the frequency distribution of other headache-related findings.

Table 1
The frequency distribution of different types of headaches according to clinical findings

	N (%)
Eclampsia	66 (11%)
Pre-eclampsia	430 (70%)
Thrombosis	8 (1%)
Hemorrhaging AVM	5 (0.8%)
Hemorrhaging aneurysm	5 (0.8%)
Pulsating or tension headache	50 (8%)
Migraine without aura	32 (5.2%)
Migraine with aura	20 (3.2%)

Table 2
Frequency distribution of headache associated symptoms in different types of headaches among hospitalized pregnant women

	Eclampsia	Pre-eclampsia	Thrombosis	Hemorrhaging AVM	Hemorrhaging aneurysm	Pulsating	Migraine without aura	Migraine with aura	Total
Photophobia	5 (38.4%)	0	0	0	0	0	0	8 (61.5%)	13
Nausea	16 (12.7%)	77 (61.1%)	2 (1.6%)	1 (0.8%)	1 (0.8%)	13 (10.3%)	8 (6.4%)	8 (6.4%)	126
Vomiting	17 (21.2%)	49 (61.2%)	2 (1.5%)	1 (1.2%)	1 (1.2%)	1 (1.2%)	4 (5%)	5 (6.2%)	80
Fever	1 (14.2%)	2 (28.5%)	0	0	0	2 (28.5%)	1 (14.2%)	1 (14.2%)	7
Meningismus	16 (100%)	0	0	0	0	0	0	0	16
Decreased consciousness level	16 (88.8%)	0	1 (5.5%)	1 (5.5%)	0	0	0	0	18
Convulsions	16 (84.2%)	0	2 (10.6%)	0	1 (5.2%)	0	0	0	19
Blurred vision	8 (8%)	66 (66%)	2 (2%)	0	0	9 (9%)	8 (8%)	7 (7%)	100
Muscular stiffness	16 (88.8%)	1 (5.5%)	1 (5.5%)	0	0	0	0	0	18
Vertigo	10 (20%)	26 (53%)	2 (4%)	0	0	8 (16.3%)	1 (2%)	2 (4%)	49
Epigastric pain	9 (10.4%)	65 (75.6%)	1 (1.1%)	0	1 (1.1%)	8 (9.3%)	1 (1.1%)	1 (1.1%)	86
Fatigue	16 (32%)	26 (52%)	2 (4%)	1 (2%)	0	3 (6%)	1 (2%)	1 (2%)	50

DISCUSSION

Headache is the most common neurologic complaint during pregnancy which is categorized as primary or secondary headaches. The most common primary headaches are migraine and tension headaches which comprise 90% of all headaches. Secondary headaches include hemorrhagic, tumoral, thrombotic, preeclamptic, and eclamptic headaches. Various causes are mentioned in the occurrence of such headaches which are mostly attributed to estrogen level fluctuations. Most headaches improve during pregnancy and only a little percentage aggravate. The definitive method of diagnosing such headaches after physical examination is MRI. In similar studies done by Mauro et al. 87 pregnant women with eclampsia were studied during 10 years. This sample was extracted of 59,388 deliveries. Mean age of the mothers was 22 years and mean gestational age was 35 weeks, gravidity was 2 and similar to our study a significant association existed between symptoms and signs of eclampsia and gestational age. Mauro et al. only studied eclampsia-related headaches; however we studied all types of headaches. The duration of study by Mauro was longer (10 years) when compared to our study (3 years). We identified 16 patients with eclampsia. In Mauro et al. study, all symptoms and signs of eclampsia were investigated [8]. In Facchinetti et al. study in Italy, 720 pregnant women with headaches were studied. They reported that 68.1% had migraine with aura, 15.1% had tension headaches, and 1.7% had pre-eclampsia. In our study, the frequencies of migraine with aura, tension headache, and pre-eclapmsia were respectively 2.5%, 12.7%, and 73.7%. Our sample size was lower than the Italian study. In Facchinetti et al. study, a significant relationship existed between smoking and positive family history of hypertension with headache during pregnancy. We did not able to find such relationship as the required data were not included in the medical records [9]. In a

study by Ramchandren et al. in the US, 63 pregnant women in the age range of 15 to 41 years and mean age of 25.9 years were studied. Mean number of pregnancies was 2.2 and mean gestational age was 24 weeks. The frequency of headaches associated with photophobia was 59%, nausea 52%, vomiting 37%, fever 11%, neck stiffness 9%, and convulsions 7% [8]. In our study sample size was larger and the duration of the study was broader. Mean age in our sample was 30.03 years within the age range of 15 to 48 years. In Ramchandren study, 26 patients had focal findings on neuroimaging. We found such findings in 14 patients. Ramchandren study [10] did not report a relationship between age of the subjects, gestational age, gravidity, and parity. In Zhou et al. study in China on 24 pregnant women with CST, 67& had nausea and vomiting, 63% had neck spasticity, 25% had blurred vision, 33% had fever, and 13% had plegia [11]. The sample size in Zhou study was larger and reported a significant relationship between women age, gestational age, gravidity, and parity with CST [10]. In Marcus et al. study in the US, 18 patients had migraine, 16 had tension headaches, and 15 had combined migraine and tension headaches. About 30% of these headaches improved in the second and third trimesters. Migraine headache was more likely to improve compared to tension headaches or combined migraine and tension headaches [12]. Our sample size was larger. The frequency of patients with migraine headaches was 21 subjects and 40 had tension headaches. Regarding the nature of the study that was retrospective, we were not able to study the evolution of headaches.

CONCLUSION

The most prevalent cause of headache during pregnancy was pre-eclampsia and eclampsia which requires careful management of the patients. This requires awareness of pregnant women about any type of headache during pregnancy

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CONFLICT OF INTEREST

Conflict of interest declared none.

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