Research report

Depression, anxiety and stress among pregnant migraineurs in a pacific-northwest cohort

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ABSTRACT

Background: The co-occurrence of migraine and unipolar psychiatric disorders has been well documented in non-pregnant populations, however little is known in pregnant populations.
Methods: A cohort of 1321 women was interviewed during the first trimester of pregnancy. At the time of interview lifetime migraine status was ascertained using International Classification of Headache Disorders diagnostic criteria (ICHD-II). Information regarding unipolar depression, anxiety and stress during pregnancy was collected using the Patient Health Questionnaire Depression Module-9 (PHQ-9), and the Depression Anxiety Stress Scales 21-item Short Form (DASS-21). Multivariable logistic regression procedures were used to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for the association of migraine and mood disorders during pregnancy.
Results: Approximately 28.2% ($N=372$) were classified as having a lifetime history of migraine; among migraineurs 122 were classified as migraineurs with aura and 250 as migraineurs without aura. Compared with non-migraineurs, migraineurs were associated with 1.60-fold increased odds of depression as measured by a PHQ-9 score ≥ 10 (AOR=1.60; 95% CI: 1.12–2.31). Overall, migraine with aura was more strongly associated with depression than was migraine without aura. Migraineurs, as compared with non-migraineurs, also had higher odds of mood disorders as measured by the DASS-21.
Conclusions: The comorbidity of mood and migraine disorders in pregnant populations supports the need for integrated mental and physical clinical evaluation, increased vigilance, and treatment of patients with such disorders.

1. Introduction

Headache disorders, the most prevalent disorders of the neurological system, disproportionately affect women of reproductive age (Buse et al., 2013; Smitherman et al., 2013; WHO, 2011). Despite their non-lethality, migraines are a personal and societal burden, ubiquitous, and disabling (WHO, 2011). Estimates of lifetime prevalence of migraine among pregnant women range from 9–20% (Adeney et al., 2006; Frederick et al., 2014). Several studies have reported higher frequencies of preterm delivery, low birth weight, placental abruption, preeclampsia, and other hypertensive disorders among pregnant migraineurs when compared to pregnant non-migraineurs (Adeney and Williams, 2006; Chen et al., 2010; Marozio et al., 2012; Sanchez et al., 2010; Williams et al., 2011).

Mood and anxiety disorders are complications during pregnancy and the postpartum period (O'Hara and Wisner, 2014). Meta-analyses of perinatal depression report point prevalence estimates between 6–13% (Gavin et al., 2005) and studies have shown that 16% present with clinically anxious symptoms during the first trimester (Rubertsson et al., 2014); in addition, 84% of women report some form of psychosocial stress during pregnancy (Woods et al., 2010). Depression, anxiety, and stress during pregnancy have been associated with inadequate antenatal care, low birth weight, preterm delivery, small gestational age, placental abruption, self-harm, suicidal-ideation, postpartum depression, and maladaptive emotional and behavioral development of offspring (de Paz et al., 2011; Farias et al., 2013; Graignic-Philippe et al., 2014; Lee et al., 2007; Sanchez et al., 2013; Satyanarayana et al., 2011; Szegda et al., 2014; Wisner et al., 2013).

The World Health Organization (WHO) estimates that depression is three times more common in people with migraine or severe headaches compared to healthy individuals (WHO, 2012). The co-occurrence of migraine and mood disorders has been well documented in non-pregnant populations (Breslau et al., 1994,

2003; Fuller-Thomson et al., 2013; Gelaye et al., 2013; Jette et al., 2008; Kalaydjian and Merikangas, 2008; McWilliams et al., 2004; Merikangas et al., 1990; Nguyen and Low, 2013; Patel et al., 2004; Saunders et al., 2014; Swartz et al., 2000; Zwart et al., 2003). Recent evidence suggests that migraine and mood disorders may be common among pregnant women (Cripe et al., 2010; Williams et al., 2010). In a study of 2293 pregnant women, 55.1% of migraineurs reported moderate to severe depressive symptoms during pregnancy compared to 36.7% of non-migraineurs (Cripe et al., 2010). Furthermore, migraineurs score higher on the Perceived Stress Scale (PSS) than non-migraineurs during the first trimester of pregnancy (mean $\pm$ SD: 4.2 ± 2.4 vs. 3.7 ± 2.3; p-value: 0.008) (Williams et al., 2010). To our knowledge very few studies have reported on the co-occurrence of migraine and mood disorders during the antepartum period (Cripe et al., 2011, 2010; Williams et al., 2010). Therefore, we sought to examine the extent to which migraine is associated with depression, anxiety, and stress during pregnancy from a large prospective cohort study of pregnant women.

2. Methods

2.1. Study population and data collection procedures

This study was conducted among 1321 pregnant women enrolled in the ongoing Migraine and Pregnancy Study, a prospective cohort study designed to investigate the relationship between migraine and headache symptoms prior to and during pregnancy, and the risk of adverse perinatal outcomes including preeclampsia. Pregnant women attending prenatal care at clinics affiliated with the Swedish Medical Center in Seattle Washington from November 2009 to March 2013 were recruited. Women were eligible if they initiated prenatal care at or prior to 20 weeks gestation, were 18 years of age or older, spoke and read English, planned to carry the pregnancy to term, and planned to deliver at the Swedish Medical Center. At enrollment participants completed an interviewer-administered survey where information regarding sociodemographics, pre-pregnancy general health, reproductive and medical history, and migraineur status were collected. Participants were then asked to complete two brief self-administered survey instruments to screen for symptoms of depression, anxiety, and stress using the Patient Health Questionnaire Depression Module-9 (PHQ-9), and the Depression Anxiety Stress Scales 21-item Short Form (DASS-21), both of which have been validated for use in perinatal populations (Kroenke et al., 2001; Meades and Ayers, 2011; Spitzer et al., 2000; Zhong et al., 2014). Multiple psychiatric instruments were used to improve our ability to assess maternal antepartum mood disorders as they relate to migraine status. The procedures used in the study were in agreement with the protocol approved by the Institutional Review Board of Swedish Medical Center, Seattle, WA. All participants provided written informed consent.

2.2. Survey Instruments

2.2.1. Migraine

Migraine was assessed using a structured questionnaire adapted from the deCode Genetics migraine questionnaire (DMQ3). The DMQ3 was recently validated to diagnose migraine with a sensitivity of 99%, specificity of 86%, and kappa statistic of 0.89 (Kirchmann et al., 2006). During the migraine assessment participants were asked if they had ever experienced headache episodes. Headache classification was determined using the International Classification of Headache Disorders diagnostic criteria (ICHD-II), established by the International Headache Society (ICHD, 2004). Women with "any migraine" refer to women with definitive migraine. Definitive migraine was defined by at least 5 lifetime headache attacks lasting 4–72 h with: (1) at least two of the qualifying pain characteristics (unilateral location, pulsating quality, moderate or severe pain intensity, or aggravation by routine physical exertion); and (2) at least one of the associated symptoms (nausea and/or vomiting, photo/phonophobia); and (3) not readily attributed to another central nervous system disorder or head trauma (according to subject self-report). Women who met these criteria are referred to as migraineurs throughout our study. Migraineurs with aura fulfilled all of the aforementioned criteria for definitive migraine in addition to at least two aura attacks consisting of: (1) at least one of the following (fully reversible visual symptoms, fully reversible sensory symptoms, or fully reversible dysphasic speech disturbance) but no motor weakness; and (2) at least two of the following (homonymous visual symptoms and/or unilateral sensory symptoms, the development of at least one aura symptom that develops gradually over ≥ 5 minutes, and/or each symptom lasts ≥ 5 and ≤ 60 minutes). (ICHD, 2004) Using these criteria we categorized migraineurs to either migraineur with aura, or migraineur without aura.

2.2.2. PHQ-9

The PHQ-9 is a self-administered module that ascertains unipolar depression by asking: "Over the last two weeks, how often have you been bothered by any of the following problems". The problems assessed feelings of feigned interest, hopelessness, trouble sleeping, lack of energy, changes in appetite, self-deprecation, trouble concentrating, changes in physical behavior, and thoughts of self-harm. The 9-item instrument asks respondents to rate the relevancy of each statement over the past two weeks on a four-point scale ranging from: (0) not at all, (1) several days, (2) more than half the days, and (3) nearly every day. Scores range from 0 to 27. Validated cutoffs were used to categorize PHQ-9 scores (Kroenke et al., 2001). Briefly, a score of ≥ 10 on the PHQ-9 is associated with 88% sensitivity and 88% specificity in diagnosing unipolar major depressive disorder (MDD) using the Diagnostic Statistical Manual Fourth Edition criteria (Kroenke et al., 2001). Additionally, we categorized participants as exhibiting minimal (score 0–4), mild (score 5–9), moderate (score 10–14), and severe (score ≥ 15) depressive symptoms on the PHQ-9 scale.

2.2.3. DASS-21

The DASS-21 is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety, and stress (Depression Anxiety Stress Scales, 2013). The depression scale assessed dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest or involvement, anhedonia, and inertia; the anxiety scale assessed autonomic arousal, situational anxiety, and subjective experience of anxious affect; and the stress scale assessed difficulty relaxing, nervous arousal, easy agitation, irritability, and impatience (Lovibond, 1998; Lovibond and Lovibond, 1995). The 21-item instrument asks respondents to rate the relevancy of each of the three negative affective states over the past week on a four-point scale ranging from: (0) not at all, (1) some of the time, (2) a good part of the time, and (3) most of the time. Scores range from 0 to 21 in each of the three domains, and are then multiplied by two to produce a possible score of 0 to 42 in each of the three domains. Validated cutoffs were used to categorize DASS scores (Lovibond and Lovibond, 1995). Briefly, we categorized participants as exhibiting minimal (score 0–9), mild (score 10–13), moderate (score 14–20), and severe (score ≥ 21) depressive symptoms on the DASS Depression subscale. The corresponding cutoffs for the DASS Anxiety subscale were minimal (score 0–7), mild (score 8–9), moderate (score 10–14), and severe (score ≥ 15). The corresponding cutoffs for the DASS Stress subscale were minimal (score 0–14), mild (score 15–18), moderate (score 19–25), and severe (score ≥ 26). In addition