Research paper

Poor sleep quality, antepartum depression and suicidal ideation among pregnant women

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ABSTRACT

Objective: To evaluate the independent and combined associations of maternal self-reported poor sleep quality and antepartum depression with suicidal ideation during the third trimester

Methods: A cross-sectional study was conducted among 1298 pregnant women (between 24 and 28 gestational weeks) attending prenatal clinics in Lima, Peru. Antepartum depression and suicidal ideation were assessed using the Patient Health Questionnaire-9 (PHQ-9). The Pittsburgh Sleep Quality Index (PSQI) questionnaire was used to assess sleep quality. Multivariate logistical regression procedures were used to estimate odds ratios (OR) and 95% confidence intervals (95% CI) after adjusting for putative confounders.

Results: Approximately, 17% of women were classified as having poor sleep quality (defined using the recommended criteria of PSQI global score of > 5 vs. ≤5). Further, the prevalence of antepartum depression and suicidal ideation were 10.3% and 8.5%, respectively in this cohort. After adjusting for confounders including depression, poor sleep quality was associated with a 2.81-fold increased odds of suicidal ideation (OR=2.81; 95% CI 1.78–4.45). When assessed as a continuous variable, each 1-unit increase in the global PSQI score resulted in a 28% increase in odds for suicidal ideation, even after adjusting for depression (OR=1.28; 95% CI 1.15–1.41). The odds of suicidal ideation was particularly high among depressed women with poor sleep quality (OR=13.56 95% CI 7.53–24.41) as compared with women without either risk factor.

Limitations: This cross-sectional study utilized self-reported data. Causality cannot be inferred, and results may not be fully generalizable.

Conclusion: Poor sleep quality, even after adjusting for depression, is associated with antepartum suicidal ideation. Our findings support the need to explore sleep-focused interventions for pregnant women.

1. Introduction

Suicidal behaviors are the leading causes of injury and death during pregnancy and postpartum (Lindahl et al., 2005; Oates, 2003) in some countries. During pregnancy, suicidal ideation is more common than suicidal attempts or deaths, with 5–14% of women reporting suicidal thoughts (Lindahl et al., 2005). Suicidal ideation is often considered as a key predictor of later suicide attempt and completion and presents an

opportunity for intervention prior to self-harm (Nock et al., 2008). Prior investigators have examined risk factors for suicidal ideation (Gelaye et al., 2016). These include history of abuse, sociodemographic characteristics, psychiatric comorbidities, gender norms, family dynamics, and cultural differences (Gelaye et al., 2016). There is an accumulating body of literature implicating sleep disturbances such as nightmares, insomnia, and poor sleep quality as important risk factors for suicidal ideation, suicide attempts, and death by suicide (Ağargün

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et al., 1997a, 1997b; Bernert et al., 2005; Fawcett et al., 1990; Goldstein et al., 2008; Krakow et al., 2000).

Pregnancy is characterized by multiple hormonal and anatomical changes, often leading to sleep disturbances (Dzaja et al., 2005; Facco et al., 2010; Hedman et al., 2002; Pien and Schwab, 2004). However, to date, we are aware of one study (Gelaye et al., 2015) that assessed self-reported sleep quality and suicide ideation among pregnant women during the first trimester. Given (1) this gap in the literature, and (2) that sleep complaints are more pronounced in late pregnancy, we sought to examine the associations of self-reported poor sleep quality and antepartum depression with suicidal ideation in pregnant women during the third trimester.

2. Methods

2.1. Study population

This study was conducted using a cohort of pregnant women enrolled in the Screening, Treatment and Effective Management of Gestational Diabetes Mellitus (STEM-GDM) study, between February 2013 and June 2014. STEM-GDM is a prospective cohort study aimed at evaluating the prevalence of gestational diabetes mellitus (GDM) using the International Association of Diabetes and Pregnancy Study Groups (IAPSG) diagnostic criteria (Wendland et al., 2012). The cohort consisted of pregnant Peruvian women attending perinatal care at Instituto Nacional Materno Perinatal (INMP), the primary referral hospital for maternal and perinatal care in Lima Peru. Women were eligible if they were between 24 and 28 weeks gestation, were 18 years of age or older, spoke and read Spanish, and planned to deliver at INMP. Informed written consent was obtained from all participants. The Institutional Review Boards of the INMP, Lima, Peru and the Harvard T.H. Chan School of Public Health Office of Human Research Administration, Boston, MA, USA granted approval for the research protocol used in this study.

2.2. Analytical population

The study population is derived from information collected from participants who enrolled in the STEM-GDM study. A total of 1774 eligible women were approached and 1299 (73%) agreed to participate. After excluding 1 participant with missing information on the PHQ-9 questionnaire, the final analyzed sample included 1298 participants.

2.3. Assessment of sleep quality

The PSQI is a 19-item self-administered survey designed for the subjective evaluation of sleep quality and disturbances in clinical populations over the past month (Buysse et al., 1989). The 19 items are categorized into seven clinically derived components including (1) sleep duration, (2) disturbances during sleep, (3) sleep latency, (4) dysfunction during the day due to sleepiness, (5) efficiency of sleep, (6) overall sleep quality and (7) need medication to sleep. Each component score is weighted equally from 0 to 3 and then summed to obtain a global score ranging from 0 to 21. Higher global scores indicate poorer sleep quality. A distinction between good and poor sleep is based on a global PSQI score > 5, which yields 89.6% sensitivity and 86.5% specificity (Buysse et al., 1989). Among pregnant Peruvian women, the Spanish-language version of the PSQI instrument has been found to have good construct validity (Zhong et al., 2015b).

2.4. Depressive symptoms

Depressive symptomatology during pregnancy was evaluated using the eight-item depression module of the Patient Health Questionnaire (PHQ-8) which includes all items from the PHQ-9 except for suicidal ideation. The PHQ-9 has been demonstrated to be a reliable tool for assessing depressive disorders among a diverse group of obstetrics-gynecology patients (Spitzer et al., 1999) and in Spanish-speaking women (Wulsin et al., 2002; Zhong et al., 2015a). The questionnaire evaluates depressive symptoms experienced by participants in the two weeks preceding the evaluation on a four-point scale (a) never; (b) several days; (c) more than half the days; or (d) nearly every day. The first 8 questions were used to calculate an overall depression score. Participants with PHQ-8 score ≥10 were categorized as showing depression, similar to the cutoff for the PHQ-9.

2.5. Suicidal ideation

Suicidal ideation was evaluated based on participants' response to question 9 of the PHQ-9 (thoughts that you would be better off dead, or of hurting yourself in some way) in the 2 weeks prior to evaluation. Participants who responded with "several days," "more than half the days," or "nearly every day," were classified as "yes" for suicidal ideation. Participants who responded "not at all" were classified as "no" for suicidal ideation.

2.6. Other covariates

Participants completed a structured interview that collected detailed information on maternal sociodemographic characteristics, reproductive and medical histories, as well as lifestyle characteristics. Participants' age was categorized as: 18–19, 20–29, 30–34 and ≥35 years. Other variables included maternal race (Mestizo vs. others), years of education (≤6, 7–12, and > 12 years), marital status (married or living with partner vs. others), employment status (yes vs. no), difficulty accessing basic foods (hard vs. not very hard), parity (nulliparous vs. multiparous), planned current pregnancy (yes vs. no), smoke during pregnancy (yes vs. no), alcohol use during pregnancy (yes vs. no), gestational age at interview, pre-pregnancy body mass index (BMI), BMI at interview, and self-reported health in the last year (good vs. poor).

2.7. Statistical analysis

We first examined participants' maternal sociodemographic, lifestyle, behavioral and reproductive characteristics according to suicidal ideation. Student's *t*-tests Wilcoxon Rank Sum Test were used to determine differences in distributions for continuous variables, and Chi-square tests or Fisher exact tests were used for categorical variables. Multivariable logistic regression models were used to calculate odds ratios (ORs) and 95% confidence intervals (95%CIs) for suicidal ideation in relation to maternal reports of sleep quality and antepartum depression. To assess confounding, we entered covariates into each model one at a time and compared adjusted and unadjusted ORs. Final models included covariates that altered unadjusted ORs by at least 10% and those that were identified *a priori* as potential confounders. To determine the independent and joint effects of poor sleep quality and antepartum depression on suicidal ideation, we categorized participants as: (1) good sleep quality and no depression, (2) good sleep quality and depression, (3) poor sleep quality with no depression and (4) poor sleep quality with depression. Participants with good sleep quality and no depression were the reference group against which women in the other categories were compared. Additionally, we evaluated the odds of suicide ideation across tertiles of PSQI global scores, where tertiles were defined based on the distribution of the PSQI scores of the entire cohort. Linear trends in odds of suicide ideation were evaluated by modeling the three tertiles as a continuous variable after allocating scores of 1, 2 and 3 for sequentially higher tertiles. We next modeled PSQI global scores as a continuous variable to evaluate linear trends in risk of suicide ideation. Finally, we explored the possibility of a nonlinear relationship of PSQI global score with suicidal ideation by fitting a multivariable logistic