Full length article

Factors associated with insomnia in pregnancy: A prospective Cohort Study

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A R T I C L E   I N F O

A B S T R A C T

Objective: To quantify insomnia and their components in a longitudinal cohort of pregnant women and factors associated with insomnia.
Study design: A prospective cohort of 486 healthy singleton pregnancies assembled before the 14th gestational week (February 2013 to March 2016). Insomnia data were collected pre-gestationally, in each trimester and six months post-partum, analysing five different moments. Multiple logistic regression analysis was performed to generate adjusted Odds Ratios (aOR) with 95% confidence intervals (CI) of determinants of insomnia in each trimester, defined using Athens Insomnia Scale (AIS) as score ≥ 8.
Results: Insomnia prevalence was 6.1% (3.9–8.9) pre-gestational, 44.2% (39.3–49.6) in first trimester (T1), 46.3% (41.9–51.3) in second (T2) and 63.7% (57.7–67.8) in third trimester (T3). Post-gestational insomnia was 33.2% (28.2–37.9) ($p < 0.001$ pre-gestational vs T1, T2 vs T3 and T3 vs after pregnancy). There was worsening mean AIS score, from: 2.34 before pregnancy to 9.87 in T3 because the deterioration of nighttime sleep, in absolute terms, but daytime impact was higher in T1. Previous trimester insomnia was associated with insomnia in T2 (aOR = 4.21, 95% CI 2.78–6.37) and T3 (aOR = 4.43, 95% CI 2.77–7.08). Pre-gestational insomnia was determinant of insomnia in T1 (aOR 12.50, 95% CI 3.58–43.60) and obesity was associated with insomnia in T3 (aOR = 2.30, 95% CI 0.99–5.32). On the contrary, moderate physical activity reduced the odds of insomnia in T3 (aOR 0.65, 95% CI 0.40–1.03).
Conclusions: Insomnia prevalence was high from the beginning of pregnancy, associated with pre-gestational insomnia. In late pregnancy, two out of three pregnant women suffering insomnia. Insomnia prevention should be targeted particularly to those with high body mass index and pre-gestational insomnia.

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Introduction

Insomnia is the most prevalent sleep disorder in general population [1], and it is considered an important public health issue [2].

In pregnancy, the oestrogen and progesterone produce changes in the sleep patterns associated with women hormonal cycles, generating an increasing prevalence of hypersomnia and insomnia [3]. Lee et al., observed that there is less deep sleep in the first trimester of pregnancy and lower sleep efficiency than baseline pre-pregnancy values [4]. Also, in pregnancy there is an increase of respiratory sleep problems, restless legs syndrome, sleepiness, short sleep duration, fragmentation and poor sleep quality [5–9]. But the most documented problem is insomnia, with an increasing prevalence trough pregnancy, with the highest in third trimester, around 70% [10,11].

Insomnia is a risk factor of hypertension and preeclampsia in pregnancy [9,12], gestational diabetes mellitus [12], depression [10,13,14], preterm delivery [15] and non-planning caesarean [9].

Even insomnia proper management decreases the rate and severity of these related health problems [12,16], yet little attention has been paid to insomnia during pregnancy. In fact, it has not been included in guidelines of routine prenatal care [17–19] so far.

To our knowledge, the few prospective cohort studies that analyse prevalence of insomnia in pregnancy do not focus on the three trimesters in the same cohort, only in two of them [6,14] or at late pregnancy and after pregnancy [2,10,20]. Moreover, there is few evidence of risk factors associated with insomnia in pregnancy. Thus, previous studies showed a high risk of pregnancy insomnia in women over 20 years old and in those with depression [21], in smoker women, women with hypertension and with the proximity to delivery [11]. But there is no clear information regarding the association between sociodemographic variables, physical activity and insomnia in pregnancy.

Our aim was to quantify insomnia pre-gestationally, throughout pregnancy and post-gestationally, and to analyse factors associated with insomnia in a cohort of healthy pregnancies.

Material and methods

Design and study population

We carried out a prospective cohort study from February 2013 to March 2016. Our reference population was all pregnant women followed up in primary care in the public health service of Andalusia (south Spain including provinces of Granada, Jaen, Huelva and Seville). Eligible women were those attending health-care centres with midwives who voluntarily participated in the data collection.

Selection criteria

Included women had to meet the following selection criteria: 1) have a simple healthy pregnancy; 2) with no previous diseases that alter diet or physical activity, such as diabetes, hypertension, moderate or severe heart failure, respiratory failure, kidney or liver disease and neurological or musculoskeletal diseases influencing the mobility, 3) to be registered in the healthcare centre before the 14th gestational week, 4) with no language or cognitive barriers affecting the communication, and 5) agree to participate in the study. Women who did not meet these criteria in the recruitment time or had a miscarriage through the follow up were excluded.

Eligible women were identified by midwives at the healthcare centres on their first pregnancy visit. Subsequently, the required information was gathered by personal or telephone interview at three stages during pregnancy (before gestational week 14, gestational week 24 ± 2, and after gestational week 32), and about six months after birth. In the first interview, information related to early gestational weeks and pre-gestational period was collected.

Initially, information was collected from 518 women of whom 486 met inclusion criteria, and 463 were followed up till the second and/or third trimester. Accepting an alpha level of 0.05 and a beta of 0.2 in a one-sided test, the available volume of data allowed us to evaluate as statistically significant difference between an initial insomnia proportion of 0.5 and a final proportion of 0.6.

Variables and instruments

The variables measured were: (a) Socio-demographic variables: age, educational level (primary, secondary, university), social class (I–V), work outside home (no, yes) and number of previous children (0, 1, ≥ 2); (b) Anthropometric variables: height and weight at first interview, body mass index was estimated as weight (Kg) divided by height (metres) squared; (c) Physical activity: we used the Short International Physical Activity Questionnaire, and considered women with moderate or vigorous level of physical activity as active, and those with a lower level as inactive and (d) Athens Insomnia Scale (AIS) [22]. AIS is an eight items scale, in accordance with the ICD-10 criteria for insomnia, which have been translated and validated in the Spanish population [23] and previously used in pregnant women [13]. Each item receives from 0 to 3 points, 0 when there is no problem and 3 points for a severe disturbance. The total score is the sum of the scores of each of the
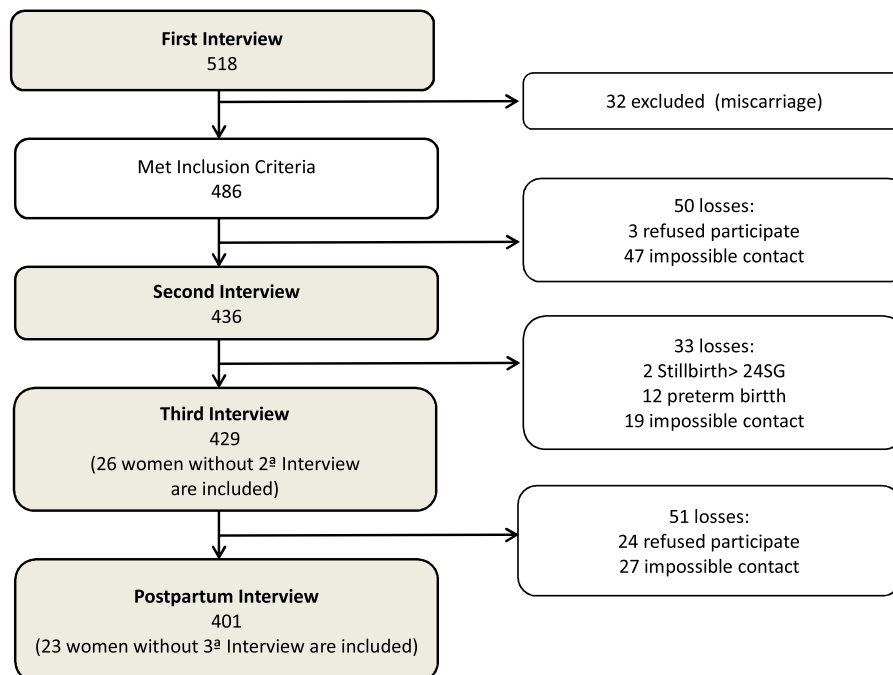

Fig. 1. Study's flowchart.