Sleep disturbance in late pregnancy and type and duration of labour

Article *in* Journal of Obstetrics and Gynaecology · August 2011

DOI: 10.3109/01443615.2011.579196 · Source: PubMed

5 authors, including:

Ilana Naghi
Barnabas Health
14 PUBLICATIONS **84** CITATIONS
SEE PROFILE

Abbas Tavallaii
Baqiyatallah University of Medical Sciences
40 PUBLICATIONS **581** CITATIONS
SEE PROFILE

Mohammad Khak
Shahid Beheshti University of Medical Sciences
27 PUBLICATIONS **180** CITATIONS
SEE PROFILE

Journal of Obstetrics and Gynaecology, August 2011; 31: 489–491

ISSN 0144-3615 print/ISSN 1364-6893 online
DOI: 10.3109/01443615.2011.579196

informa
healthcare

OBSTETRICS

Sleep disturbance in late pregnancy and type and duration of labour

I. Naghi[1], F. Keypour[2], S. B. Ahari[3], S. A. Tavalai[4] & M. Khak[5]

Department of Obstetrics and Gynecology, [1]Shaheed Beheshti University of Medical Sciences, [2]Shahid Akbarabadi Hospital, Tehran University of Medical Sciences, [3]Tehran University of Medical Sciences, [4]Psychiatrist, Baghiatollah Medical University and [5]Tehran University of Medical Sciences, Tehran, Iran

In this study, the relationship between sleep quality and type and duration of labour has been evaluated. A total of 88 pregnant women completed the Pittsburgh Sleep Questionnaire three times during their last 3 weeks of pregnancy at their prenatal visits and once postpartum. A mean score of >5 was considered as poor-quality sleep. Duration of labour, type of delivery and weight of the newborn at delivery was considered. Of the study population, 56.2% were categorised as the good-quality sleep group and 43.8% as the poor-quality sleep group. The reported sleeping time per day was 8.47 ± 1.86 hours for the good-quality sleep group and 6.45 ± 2.07 hours for the poor-quality sleep group. The poor-quality sleep women were 20% more likely to undergo caesarean section and had a longer labour duration. Gestational age at delivery and mean gravidity was respectively 38.53 ± 1.17 weeks and 1.91 ± 1.03 in the good-quality sleep group and 38.36 ± 1.59 weeks and 1.86 ± 1.07 in the poor-quality sleep group. Thus, it was found that women with sleep problems experience longer labour duration and are more likely to undergo a caesarean section.

Keywords: Duration of labour, Pittsburgh Sleep Questionnaire, sleep disturbance, sleep quality, 3rd trimester, type of labour

Introduction

As a result of homeostatic and circadian influences, human beings spend approximately one-third of their lives asleep (Saper et al. 2005). Sleep duration increases significantly during the 1st trimester of pregnancy (Ross et al. 2005; Soares and Murray 2006; Izci et al. 2005) and decreases throughout the 3rd; furthermore, broken sleep and fatigue increase in late pregnancy (Okun and Coussons-Read 2007). Sleep disorders are frequently reported in pregnant women (Dzaja et al. 2005; Lee and Gay 2004) and are usually followed by disturbed mental focus, functionality and disturbed mood (Papp et al. 2004). The most common sleep-related complaints are multiple awakening and the inability to fall back to sleep in a reasonable timeframe (Okun and Coussons-Read 2007; Mindell and Jacobson 2000); as a result, women were found to nap more during the day by the end of pregnancy (Mindell and Jacobson 2000).

Poor-quality sleep is associated with an increased risk of depression (Breslau et al. 1996; Perlis et al. 1997). Whereas diabetes, obesity and cardiovascular disease are also reported to be associated with short sleep duration; the complications here can be of relevance to several pregnancy complications (Bjorvatn et al. 2007; Meisinger et al. 2007).

Interrupted sleep in the postpartum period has been evaluated in many researches, however, the energy and concentration required for a well done parturition necessitates evaluation of sleep quality prior to the labour onset. Although it is not clearly proven, many studies suggest sleep disturbance to be associated with an adverse pregnancy outcome. Lee and Gay (2004) reported an increased caesarean delivery rate and labour duration in pregnant women experiencing <6 hours sleep at night. Pre-eclampsia, gestational hypertension and small-for-gestational-age infants are associated with sleep disordered breathing, a main complaint of patients with poor-quality sleep (Izci et al. 2005; Pérez-Chada et al. 2007). Women with pre-eclampsia are reported to have experienced poorer sleep quality throughout their pregnancy (Edwards et al. 2000).

The present study was designed to evaluate the relationship between sleep quality and the type and duration of labour.

Materials and methods

A total of 550 pregnant women in their 36th week of gestational age were recruited at two antenatal clinics affiliated to Iran University of Medical Sciences from October 2008 to May 2009 via consecutive sampling. All subjects gave written informed consent, which had the approval of the Iran University of Medical Sciences ethical advisory committee and followed the Helsinki Declaration. Exclusion criteria included any pregnant woman who worked nightshift, used narcotics, had previous caesarean section or was scheduled for a caesarean delivery. A total of 505 women were finally included in the study.

The Pittsburgh Sleep Questionnaire (PSQ) (Knutson et al. 2006), in which 19 multiple choice questions are considered regarding sleep quality, the time taken to fall asleep, sleep problems, somnifacient usage before sleep and daytime sleepiness interfering with daily activities, was used to collect the information about sleep quality. Each item received a score from 0 to 3 and each subject completed the test three times in their last prenatal care visits (1 week each) and once after delivery. A mean score of >5 indicated a poor-quality sleep. In order to measure the reliability, eight pregnant women completed the questionnaire in 7 days and a good test–re-test reliability ($r = 0.83$) and internal consistency (Cronbach alpha 0.74–0.88) was obtained.

A checklist was used to record the pregnant women's demographic data (age, weight, height), gestational age at delivery, type of delivery, labour duration and weight and sex of the newborn. Labour duration was defined as the time from the beginning of regular contraction to the time of birth and delivery type was categorised as caesarean section, spontaneous vaginal delivery

Correspondence: I. Naghi, Evin Street, Chamran Highway, Shahid Beheshti University of Medical Sciences, Tehran, Iran. E-mail: swt_f@yahoo.com

or vaginal delivery induced by oxytocin (syntocinon, Novartis, Germany). No epidural analgesia was used in our study according to the protocol of our clinics.

The data were statistically analysed using SPSS software program, version 11.5, for Windows (SPSS Inc, Chicago, IL). The χ^2-square, ANCOVA and independent *t*-test were used for statistical analysis when appropriate. Qualitative values were noted as mean and standard deviation. A *p* value of <0.05 was considered as statistically significant.

Results

Of the 505 pregnant women included in the study, 488 completed the questionnaires as structured. A total of 274 (56.2%) were finally categorised into a good-quality sleep group and 214 (43.8%) into a poor-quality sleep group. There was no statistically significant difference between the two groups in gestational age of pregnant woman and BMI, sex and weight of the newborns. Duration of labour was significantly longer in the poor-quality sleep group ($p = 0.016$) (Table I).

The reported sleeping time per day was 8.47 ± 1.86 hours for good-quality sleep and 6.45 ± 2.07 hours for poor-quality sleep, with a total of 7.6 ± 2.2 hours for both (ranging from 2 to 18 hours); the difference was statistically significant ($p < 0.001$). The mean time spent asleep during the afternoon was 1.82 ± 0.23 and 4.32 ± 0.84 hours for good- and poor-quality sleep groups, respectively, with a significant difference between the two groups ($p < 0.001$).

A total of 249 participants (51%) underwent caesarean section and 238 (49%) gave birth to the newborn through normal vaginal delivery. In the good-quality sleep group, 160 (58.4%) women gave birth to their child through vaginal delivery, while 114 (41.6%) underwent caesarean section; this was 79 (36.9%) for vaginal delivery and 135 (63.1%) for caesarean section in the poor-quality sleep group women. Hence, prevalence of caesarean section was significantly higher in the poor-quality sleep group ($p < 0.001$). Labour induction with oxytocin was performed for 195 (89.4%) women with normal sleep and 156 (88.8%) with sleep disturbance.

There was no significant difference between the two groups in gestational age at delivery ($p > 0.05$) (Table I). Mean gravidity and parity was respectively 1.91 ± 1.03 and 1.42 ± 0.90 in the normal sleep group and 1.86 ± 1.07 and 1.39 ± 1.04 in the poor-quality sleep group, with no significant difference.

Discussion

In this study, the poor-quality sleep pregnant women were more likely to undergo caesarean section rather than the good-quality sleep women. Furthermore, when giving birth through natural vaginal delivery, the labour duration was significantly longer in the poor-quality sleep group. Approximately 44% of the samples experienced sleep disturbance in the last months of pregnancy, which was previously reported to range from 15–80% (Soares and Murray 2006; Mindell and Jacobson 2000). The average hours of night sleep in all the subjects (7.6 hours) was compatible with that of non-pregnant women in reproductive age in the normal population (Pérez-Chada et al. 2007; Edwards et al. 2000) however, the total hours of night sleep in the poor-quality sleep group was significantly less than women with normal sleep, compensated by more hours of daytime sleep. Pregnant women who had sleep disruption, tried to compensate for their sleep insufficiency with subsequent daytime sleep (Soares and Murray 2006; Okun and Coussons-Read; 2007), even though a daytime nap may not necessarily be of the same restorative value as night sleep (Ross et al. 2005).

Lee and Gay (2004) reported pregnant women with disrupted sleep experienced longer labour duration and a greater chance of caesarean section; however, there are studies suggesting sleep quality not to affect labour duration and type of delivery (Evans et al. 1995).

Natural vaginal delivery is a high energy expending process; as a result, sleep deprivation decreases the ability to perform a perfect labour (Beebe and Lee 2007). This can explain the longer labour duration in the poor-quality sleep group. We studied sleep quality during the last month of gestation in order to evaluate the cumulative effect of resultant fatigue of sleep deprivation. In another study, hyperalgesia was claimed to occur as a result of sleep deficiency (Roehrs et al. 2006). Although we did not compare the two groups regarding hyperalgesia, pain itself could justify the longer labour duration in the poor-quality sleep group.

This study confirms that childbearing women who had poor-quality sleep were 20% more likely to have a caesarean section than women who had good-quality sleep. As pregnant women with a history of prior caesarean section and those planning an elective caesarean section were excluded from the study, the hypothesis that the higher rate of caesarean section in the poor-quality sleep group resulted from the fatigue caused by sleep shortage was considered. In a further study, it was claimed that women who slept <6 hours at night were 4.5 times more likely to undergo caesarean section (Lee and Gay 2004).

The overall caesarean rate in Iran was once estimated to be about 40.4% and it has had a progressing trend (Moini et al. 2007) and now Iran is reported to be among the nations with the highest caesarean rates (30–40%) (Thomas 2006). The overall rate of caesarean section in our study population was even higher, which is mainly due to the referral nature of our clinics; many patients with possible complications are admitted to our hospital and a higher caesarean section rate is therefore expected. Induced labour, especially among the nulliparae, is also known as a risk

Table I. Basic characteristics of the pregnant women and the neonates.

	Good-quality sleep group		Poor-quality sleep group		
Variable	*n*	(%)	*n*	(%)	*p* value
n	274	56.2	214	43.8	NS
Age (years)	25.28 ± 5.86		26.66 ± 5.47		0.019
BMI (kg/m^2)	23.74 ± 1.32		24.57 ± 2.04		NS
Duration of labour (h) (mean ± SD)	8.83 ± 3.05		11.87 ± 4.32		0.016
Gestational age at delivery (weeks) (mean ± SD)	38.83 ± 1.17		38.66 ± 1.59		NS
Male newborn (%)	155	56.6	104	48.6	NS
Female newborn (%)	119	43.4	110	51.4	NS
Mean birth weight (g) (mean ± SD)	3284.43 ± 439.29		3283 ± 480.07		NS

NS, not significant; BMI, body mass index.

factor (Wilson et al. 2010); oxytocin induction was used for 89.4% of women with normal sleep and 88.8% of those with sleep disturbance. The authors have also observed that Iranian pregnant women are increasingly becoming overweight and show a high phobic attitude towards vaginal delivery, both of which influence the caesarean rate in our clinics.

Labour duration is affected by the pregnant woman's parity; a multiparous woman has to spend more time to take care of other children, resulting in less time for sleep (Lee and Gay 2004). In our study, considering gravidity, there was no significant difference between the two groups, however, a more reliable result was expected if only nulliparous women were recruited.

Questionnaire-based characteristics of this study make subjectivity a big concern; however, any reporting errors are likely to be similar for all participants and thus equivalent during pregnancy. An objective method could result in more reliable findings, however, Lee and Gay (2004), who used actigraphy monitoring (a relatively non-invasive method of monitoring human rest/activity cycles by a battery-operated wristwatch-size microprocessor), achieved the same results as we did in this study. Labour onset is likely to be affected by sleep deficiency and this could be considered in future studies.

Results from this study can be used to advise women in late pregnancy about expected sleep patterns and the outcomes of poor sleep on labour. It may be helpful for clinicians to discuss sleep disorders during 3rd trimester antenatal visits and explain to the pregnant women how to have an effective sleep and the consequences of sleep disturbance. Clinicians could psychologically support the pregnant women and provide them with appropriate lifestyle changes or natural remedies where needed.

Conclusion

Sleep quality did not affect the gestational age at the time of delivery and the neonatal birth weight. Also, gravidity did not correlate with sleep quality. Women with sleep problems experienced longer labour duration and were more likely to undergo a caesarean section. Women should discuss sleep problems during the last months of pregnancy and if present, a physician consultation may help reduce labour complications.

Acknowledgement

The authors wish to thank the Farzan Institute, Tehran, Iran, for their kind consultation in preparing this paper.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

References

Beebe KR, Lee KA. 2007. Sleep disturbance in late pregnancy and early labour. Journal of Perinatal and Neonatal Nursing 21:103–108.

Bjorvatn B, Sagen IM, Øyane N, Waage S, Fetveit A, Pallesen S, et al. 2007. The association between sleep duration, body mass index and metabolic measures in the Hordaland Health Study. Journal of Sleep Research 16:66–76.

Breslau N, Roth T, Rosenthal L, Andreski P. 1996. Sleep disturbance and psychiatric disorders: a longitudinal epidemiological study of young adults. Biological Psychiatry 39:411–418.

Dzaja A, Arber S, Hislop J, Kerkhofs M, Kopp C, Pollmächer T, et al. 2005. Women's sleep in health and disease. Journal of Psychiatric Research 39:55–76.

Edwards N, Blyton CM, Kesby GJ, Wilcox I, Sullivan CE. 2000. Pre-eclampsia is associated with marked alterations in sleep architecture. Sleep 23:619–625.

Evans ML, Dick MJ, Clark AS. 1995. Sleep during the week before labour: relationships to labour outcomes. Clinical Nursing Research 4:238–249.

Izci B, Martin SE, Dundas KC, Liston WA, Calder AA, Douglas NJ. 2005. Sleep complaints: snoring and daytime sleepiness in pregnant and pre-eclamptic women. Sleep Medicine 6:163–169.

Knutson KL, Ryden AM, Mander BA, VanCauter E. 2006. Role of sleep duration and quality in the risk and severity of type 2 diabetes mellitus. Archives of Internal Medicine 166:1768–1774.

Lee KA, Gay CL. 2004. Sleep in late pregnancy predicts length of labour and type of delivery. American Journal of Obstetrics and Gynecology 191:2041–2046.

Meisinger C, Heier M, Lowel H, Schneider A, Döring A. 2007. Sleep duration and sleep complaints and risk of myocardial infarction in middle-aged men and women from the general population: the MONICA/KORA Augsburg cohort study. Sleep 30:1121–1127.

Mindell JA, Jacobson BJ. 2000. Sleep disturbances during pregnancy. Journal of Obstetric, Gynecologic, and Neonatal Nursing 29:590–597.

Moini A, Riazi K, Ebrahimi A, Ostovan N. 2007. Caesarean section rates in teaching hospitals of Tehran: 1999–2003. Eastern Mediterranean Health Journal 13:457–460.

Okun ML, Coussons-Read ME. 2007. Sleep disruption during pregnancy: how does it influence serum cytokines? Journal of Reproductive Immunology 73:158–165.

Papp KK, Stoller EP, Sage P, Aikens JE, Owens J, Avidan A, et al. 2004. The effects of sleep loss and fatigue on resident-physicians: a multi-institutional, mixed-method study. Academic Medicine 79:394–406.

Pérez-Chada D, Videla AJ, O'Flaherty ME, Majul C, Catalini AM, Caballer CA, et al. 2007. Snoring, witnessed sleep apnoeas and pregnancy-induced hypertension. Acta Obstetricia et Gynecologica Scandinavica 86:788–792.

Perlis ML, Giles DE, Buysse DJ, Tu X, Kupfer DJ. 1997. Self-reported sleep disturbance as a prodromal symptom in recurrent depression. Journal of Affective Disorders 42:209–212.

Roehrs T, Hyde M, Blaisdell B, Greenwald M, Roth T. 2006. Sleep loss and REM sleep loss are hyperalgesic. Sleep 29:145–151.

Ross LE, Murray BJ, Steiner 0M. 2005. Sleep and perinatal mood disorders: a critical review. Journal of Psychiatry and Neuroscience 30:247–256.

Saper CB, Cano G, Scammell TE. 2005. Homeostatic, circadian, and emotional regulation of sleep. Journal of Comparative Neurology 493:92–98.

Soares CN, Murray BJ. 2006. Sleep disorders in women: clinical evidence and treatment strategies. Psychiatric Clinics of North America 29:1095–1113.

Thomas J. 2006. Rates of caesarean delivery in developing countries suggest unequal access. International Family Planning Perspectives 32:2.

Wilson BL, Effken J, Butler RJ. 2010. The relationship between caesarean section and labour induction. Journal of Nursing Scholarship 42:130–138.