Nocturnal Headache and Sleep Disturbance in Episodic Headache: Results of the American Migraine Prevalence and Prevention (AMPP) Study

Michael L. Reed PhD[1], Kristina M. Fanning PhD[1], Dawn C. Buse PhD[2,3], Richard B. Lipton MD[2,3]
1. Vedanta Research, Chapel Hill, NC; 2. Montefiore Medical Center, Bronx, NY; 3. Albert Einstein College of Medicine, Bronx, NY

BACKGROUND/OBJECTIVE

Nighttime headache is common, however, the frequency and symptom-related burden of these headaches have not been not well studied in non-clinic populations.

The current study describes the rates of nocturnal headache and sleep disturbance in persons with episodic migraine (EM) and assesses the associated headache-related burden.

METHODS

The AMPP is a longitudinal (2004 to 2009), population-based survey of persons with self-reported "severe headache". The current analyses are based on respondents to the 2008 and 2009 surveys who met ICHD-2 criteria for episodic migraine (EM, n=4,015) and also completed sleep and headache duration questions (n=1,859). The Sleep Disturbance (SleepD) group reported insomnia in 2008 and "trouble falling or staying asleep or sleeping too much" (past two weeks) in 2009.

METHODS (Cont.)

The Nocturnal Headache (NocH) group was defined by time of headache onset ("At what time of day does your most severe headache usually begin?") and untreated headache duration ("How long on average does this type of headache last?"). Members of this group reported headache onset after 8:00 PM and before 6:00 AM and/or untreated headaches lasting ≥24 hours or headaches with combined onset and duration lasting past 8:00 PM.

Based on the presence of Sleep Disturbance and/or Nocturnal Headache occurrence, four mutually exclusive groups were created and formed the basis of these analyses (Table 1).

Sociodemographic variables were examined across the four groups. Chi square statistic and ANOVA were used to assess group differences. Ordinal and linear regression models (adjusting for sociodemographic covariates: age, gender, income and household size) were used to assess differences among the NocH, SleepD, Both and Neither groups. Headache-related disability (MIDAS sum scores) and headache-impact (HIT-6 sum scores) were calculated for each respondent.

CONCLUSIONS

- Among individuals in the population with EM, 20.6% report both nocturnal headache and sleep disturbance.
- Individuals with both conditions were more likely to be on medical leave or occupationally disabled, have lower annual household incomes, and be older in age.
- Those with both conditions also reported greater headache-related disability and headache impact.
- It is not possible to determine directionality of effects in these cross-sectional analyses. However it is clear that nighttime headache and sleep disturbance are associated with greater disability among those with migraine.
- Healthcare professionals should be mindful of the high rates of these comorbidities among persons with EM and the related negative outcomes. Both nocturnal headaches and sleep disturbance are important targets for pharmacologic and behavioral interventions.

RESULTS

Table 1: Nocturnal Headache and Sleep Disturbance Rates

	Nocturnal HA	No Nocturnal HA	Total
	N (%)	N (%)	N (%)
Sleep Disturbance	383 (20.6%)	154 (8.3%)	537 (28.9%)
No Sleep Disturbance	894 (48.1%)	428 (23.0%)	1322 (71.1%)
Total	1277 (68.7%)	582 (31.3%)	1859 (100%)

Table 2. Sociodemographic Differences

		Neither (N=428)	NocH (N=894)	SleepD (N=154)	Both (N=383)
*Gender	Male	29.0%	16.7%	17.5%	12.8%
	Female	71.0%	83.3%	82.5%	87.2%
*Household Income	<$30,000	24.8%	21.4%	36.4%	29.5%
	$30,000 to 49,999	21.0%	22.4%	21.4%	24.0%
	$50,000 to 74,999	20.6%	24.5%	20.8%	23.2%
	≥$75,000	33.6%	31.8%	21.4%	23.2%
*Age	18-29	5.6%	3.7%	3.2%	1.0%
	30-39	11.2%	16.7%	13.0%	14.1%
	40-49	24.5%	27.0%	26.6%	24.5%
	50-59	32.9%	34.6%	29.9%	39.4%
	≥60	25.7%	18.1%	27.3%	20.9%
**On Medical Leave or Occupationally Disabled		6.1%	6.2% (p=.739)	12.3% (p=.083)	14.9% (p=.000)

*Chi Square test, p value <.05 ** Logistic Regression vs. Neither

- Among episodic migraineurs in this population, 28.9% had sleep disturbance and 68.7% had nocturnal headache. Table 1 provides the observed rates for each of the four groups in this analysis.
- Sociodemographic differences were seen across groups on gender (Chi=40.9, p<.001), household income (Chi=31.4 p<.001), household size (Chi=29.42, p<.001) and mean age (F=4.15, p<.001).
- Being on medical leave or "occupationally disabled" was more common among those with Both conditions (14.9%) versus Neither (6.1%, OR: 2.59, 95% CI: 1.54-4.36, p<.001), while SleepD (12.3%) and NocH (6.2%) were not significantly different.
- Based on ordinal logistic regression modeling, headache-related disability (MIDAS) was more severe in persons with SleepD (OR: 1.64, 95% CI: 1.08-2.48, p<.020), NocH (OR: 1.61, 95% CI: 1.23-2.13, p<.001) or Both (OR: 4.39, 95% CI: 3.23-5.96, p<.001) versus the Neither group (Figure 1).
- A similar pattern was found with linear regression modeling where mean headache-related impact (HIT-6) among subjects with SleepD (B=2.48, 95% CI: 1.00-3.96, p<.001), NocH (B=2.92, 95% CI: 1.98-3.85, p<.001) or Both (B=5.97, 95% CI: 4.85-7.09, p<.001) was more severe than those with Neither condition (Figure 2).

Figure 2: Headache-Related Disability (MIDAS Grade)

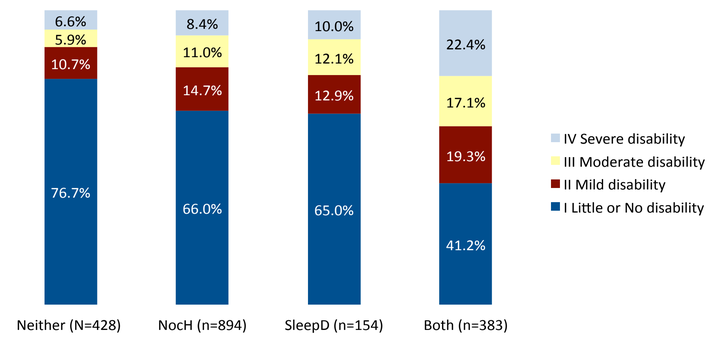
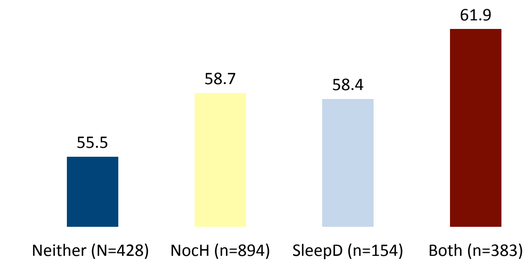


Figure 3: Headache-Related Impact (HIT-6 Sum Score)



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